Firm Diversification and Performance: The Roles of Geographic Location and Product Relatedness

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Declaration

I hereby declare that this thesis has not been submitted, either in the same or different form, to this or any other university for a degree.

The first empirical chapter has been presented at several academic conferences, including International Study Group on Export and Productivity (ISGEP)/Reading (September 2017), Strategic Management Society (SMS)/Berlin (September 2016), Academy of International Business (AIB)/New Orleans (June 2016), Academy of International Business UK & Ireland Chapter (AIB-UKI)/London (April 2016), and SYSBS International Symposium on Frontier Theories in Management/Guangzhou (December 2015). The first empirical chapter is accepted in a journal (with Yong Yang and Roger Strange, Multinational Business Review; accepted)

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Abstract

There is a growing body of research on the performance differences resulting from firms' corporate-level strategies, including international and product diversifications. However, previous studies provide mixed findings, in part due to a lack of consideration of important variables (e.g., location, ownership and product relatedness) in those studies.

The first objective of this PhD thesis is to examine the multinationality-performance relationship in an emerging economy context. Previous research has generally ignored how the location choice and ownership structure shapes the above relationship. Specifically, I analyse whether developed/developing host countries and private/state ownership have different impacts on the multinationality-performance link. Based on more than 1000 firms from 44 emerging economies in 2004-2013, I find that the returns to multinationality are higher for investment in developed countries than in developing countries, and are higher for private-owned enterprises than state-owned enterprises.

The literature on product diversification and financial performance has generally been limited to the impact of product relatedness on the product diversification-performance link, while relatedness itself is a rather broad concept. The second objective of the thesis is to fill this gap by providing a finer classification of product relatedness from a value chain perspective. Specifically, we distinguish between horizontal versus vertical relatedness, as well as upstream versus downstream relatedness, and examine whether these diversifications have different impacts on financial performance. Drawing from more than 12,000 firms from 63 countries during the period 2004-2013, the results suggest that vertical and upstream diversifications are superior diversification strategies in terms of improving firm performance.

In addition to examining the above individual effects of international and product diversifications on firm performance, as the third objective of this thesis, I analyse

their joint effects. Previous studies pay limited attention to the underlying factors that strengthen or weaken the joint effect. More specifically, I aim to examine how industrial and national contexts shape the joint effects. Drawing on the same dataset, the results suggest that the negative joint effect of international and product diversification is stronger for firms in high-tech than low-tech sectors, and is weaker for developed country firms than emerging economy firms.

The growing trend of cross-border acquisitions, as one establishment mode of foreign direct investment, is increasingly catching scholars' attention. The fourth objective of this thesis is to examine whether a foreign acquisition premium exists. Existing literature on foreign acquisition premium has generally ignored the acquirer's characteristics. My research aims to examine the impact of acquisition type (foreign/domestic) on firm productivity performance, with the consideration of acquirer's characteristics, including acquirer's location and multinationality. Using the dataset for more than 3,000 firm-year observations from 45 economies in 2004-2013, the results indicate the existence of a foreign acquisition premium. This premium is weaker for acquirers from developing economies than developed economies, and is strengthened for acquirers with high multinationality.

Abbreviation

BSD, Broad spectrum diversification

CARs, Cumulative abnormal returns

CEO, Chief Executive Officer

CSA, Country-Specific Advantage

DMNE, Developed Economy Multinational Enterprise

EBITDA, Earnings before interest, taxes, depreciation and amortization

EMNE, Emerging Economy Multinational Enterprise

FATA, The ratio of foreign assets to total assets

FDI, Foreign Direct Investment

FSA, Firm-Specific Advantage

FSTS, The ratio of foreign sales to total sales

GDP, Gross Domestic Product

GMD, Global Market Diversification

GVC, Global Value Chain

ID, International Diversification

JV, Joint Venture

LLL, Linkage, Leverage and Learning

M&A, Merger & Acquisition

MNE, Multinational Enterprise

MNSD, Mean narrow spectrum diversification

MP, Multinationality-Performance

NACE, Statistical Classification of Economic Activities in the European Community

OS, Number of foreign subsidiaries

OSTS, The ratio of the number of overseas subsidiaries to total number of subsidiaries

OC, Number of foreign countries

OCTC, The ratio of number of overseas countries to maximum number of countries

OCTS, Operating cost to sales

PD, Product Diversification

PD-P, Product Diversification-Performance

POE, Private Owned Enterprise

R&D, Research and Development

ROA, Return on assets

ROE, Return on equity

ROC, Return on total capital

ROS, Return on sales

SOE, State Owned Enterprise

TFP, Total Factor Productivity

UNCTAD, United Nations Conference on Trade and Development

WDI, World Development Indicators

WGI, Worldwide Governance Indicators

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Chapter 1

Introduction to PhD Thesis

1.1 Introduction

This thesis seeks to link geographic location and product relatedness to the effect of firm diversification on firm performance. Firm diversification is the vital corporate strategy in an organisation's expansion. The research on how firm performance is affected by international and product diversification has been an important topic of international business and strategy for more than four decades (Lu and Beamish, 2004; Majocchi and Strange, 2012; Castellani et al., 2017).

International diversification refers to when a firm diversifies into overseas geographic markets, usually through foreign direct investments such as setting up a foreign subsidiary, or through exports. International diversification can provide the potential benefits such as exploitation of firm-specific advantage, learning foreign knowledge, and cheap inputs in overseas countries (Yang and Driffield, 2012). To exploit firm-specific advantage in foreign countries, the firm internalises its valuable intangible assets instead of selling them via the imperfect external market when the transaction costs are high. The internalised market trades intermediate goods such as managerial know-how and technology know-how. To maximise profits for the headquarters, the foreign subsidiary is regarded as an extension of the multinational enterprise (MNE) structure and the place where the intangible assets are exploited. However, foreign expansion may be associated with costs such as unfamiliarity with foreign countries, initial sunk costs, and greater complexity in global coordination (Contractor, 2007).

We chose to use the geographic distribution of subsidiaries to measure international diversification. To operationalise the concepts of international diversification, we need the information on MNEs' foreign activities such as foreign sales, assets or subsidiaries. For instance, international diversification can be operationalised by focusing on the geographic distribution of sales (foreign/total sales - FSTS), the geographic distribution of assets (foreign/total assets - FATA), the geographic distribution of subsidiaries (overseas/total subsidiaries - OSTS), or a combination of the three (Sullivan, 1994). FSTS does not exclude exporting and licensing in Orbis

dataset. FATA is highly correlated with FSTS. Therefore, FSTS and FATA are ruled out. Instead, we use OSTS, which is feasible since the Orbis dataset records the ownership linkage and geographic location of the parent firm's subsidiary.

Product diversification refers to when a firm diversifies into new product markets, generally by establishing or acquiring a business unit through inter-industrial investments. Product diversification can provide potential benefits such as economies of scope, internal market efficiencies, market power advantages and portfolio effects (Palich et al., 2000). To achieve these benefits, the firm builds an intra-firm market of capital and labour, and allows the new business division to utilise complementary or similar skills and resources through the relatedness between products. Nevertheless, multi-product investment leads to costs, such as bureaucratic costs, increased information asymmetries and cross-subsidisation inefficiencies (Palich et al., 2000).

We chose to use the number of segments to measure product diversification. To operationalise the concepts of product diversification, we need the information on MNEs' diversified industry activities such as sales in each segment, or number of segments. For instance, product diversification can be operationalised by focusing on the distribution of sales in each segment (Herfindahl measure, entropy measure and Rumelt's categories), or the count of segments (product count) (Palich et al., 2000). After exploring data availability, we found difficulty in identifying the sales by segment for each firm. Therefore, we excluded the Herfindahl, entropy measure and Rumelt's categories. Instead, we employed the number of segments, which is available in Orbis as this dataset records the firm's core, primary and secondary NACE Rev.2 industry codes (4-digit level).

Geographic location is one important aspect in international business literature (Dunning, 2000). Heterogeneity exists among different geographic locations of foreign direct investment (FDI) for firms who are going abroad (Berry, 2006). By geographic location', we mean the distribution of the multinational enterprise's (MNE) subsidiaries, and whether they are established in developed or developing countries.

Product relatedness is one vital research field in the product diversification literature (Bausch and Pils, 2009). By product relatedness', we mean the relatedness between the MNE's diversified products and core product, and whether these diversified products are positioned in upstream, horizontal or downstream industries in the focal firm's view of the value chain (Chan et al., 1997; Strange and Yang, 2016). Due to the product relatedness between new business and core business, they can to some extent utilise complementary or similar tangible assets (production facility and distribution channels) and intangible assets (brand, technology know-how, marketing skills) (Benito-Osorio et al., 2012).

Recent years have witnessed a surge of foreign direct investments and product diversified investments. The World Investment Report (UNCTAD, 2017) shows that the world FDI flows slightly decreased to US$1.75 trillion, a 2 percent decrease from 2016. This report also indicates that conglomerates are becoming an increasingly common and key driving force for global diversification. As a result, more and more firm's outputs are generated in overseas geographic markets and new product markets.

In the past few decades, the research issue of firm diversification-performance has attracted a growing number of scholars who published this topic in journals of various subjects, including international business, strategy, finance and economics. However, these papers provide mixed results, partly due to the ignorance of important variables such as location, ownership structure and product relatedness. There is a need to provide a better understanding of why and how the firm diversifies into new geographic and product markets with the consideration of these important variables. This PhD thesis provides new empirical evidence on the international diversification-performance link from more than one thousand emerging economy firms, and the product diversification-performance link from more than twelve thousand firms in 63 economies during the period 2004-2013. Our analysis contains virtually all sectors to provide a better coverage of the industry diversity.

1.2 Global FDI Context

According to UNCTAD (2017), after showing a strong recovery in 2015, the world FDI flows decreased to US$1.75 trillion in 2016, corresponding to a -2 percent annual growth rate, together with weak economic growth. FDI destination is a key concern of MNE managers. After significant growth in the 2015, the FDI inflows to developed economies (particularly the US and Europe) increased further by 5 percent to US$1 trillion in 2016, corresponding to more than half (59 percent) of world FDI inflows. The FDI inflows to developing economies have decreased by 14 percent to US$646 billion.

In the Mergers and Acquisitions (M&A) trend, the World Investment Report (UNCTAD, 2017) indicates that cross-border M&A have been back on a growth track since 2014 and MNEs have more confidence in the M&A trail. Cross-border M&A experienced an increase, researching US$869 billion in 2016, the highest level since 2007, corresponding to a 2 percent annual growth rate. In recent years, cross-border M&A became the key factor driving the global rebound of FDI flow. Part of these cross-border M&A are driven by buoyant activities in developed economies.

With respect to global conglomerate, the UNCTAD (2017)'s report shows that product diversification or conglomerates (business group) are becoming increasingly popular and the vital driving force for strategic investment all over the world. Diversified firms are becoming more and more common, not only in emerging economies but also in developed countries.

In terms of the source country of global FDI, for more than ten years a surge of FDI outflow from emerging economies (developing and transition economies together) has been witnessed. Based on the World Investment Report (UNCTAD, 2017), the share of the developing economies FDI in the world grew from around 10 percent in 2000 to 28 percent in 2015. Meanwhile, FDI outflow from developing and transition economies increased to 28 percent of world FDI outflow. State-owned MNEs are significant players in worldwide FDI flows. State-owned MNEs' role in the global economy is growing, with more than half of them coming from develop-

ing countries. FDI outflows from developed economies decreased by 11 percent to US$1.1 trillion, dropping to 72 percent of world FDI outflow.

Emerging economy MNEs (EMNEs) are the subject of chapter 2, while chapters 3, 4 and 5 covers more countries, including data on developed economy MNEs (DMNEs). In addition, chapter 5 focuses on cross-border M&A, as one important form of FDI.

1.3 International Diversification

In the past few decades, a few benefits and costs have been identified by scholars to explain how the firm performs when diversifying into different geographic markets. The exploitation of firm-specific advantage, accessing the cheaper inputs in overseas countries liability of foreignness and newness, and learning foreign knowledge are the key benefits and costs in understanding the firm's internationalisation and its performance implications.

Exploitation of firm-specific advantage (FSA) is a key benefit of international diversification. The firm's competitive advantage comes from its valuable, rare, inimitable resources. Firm-specific assets are the firm's required capability to overcome the huge cost of initial foreign investment. Based on the internalisation theory and transaction cost economics (Coase, 1937; Buckley and Casson, 1976; Dunning, 2009), it is argued that, to protect and exploit these valuable assets, MNEs prefer to use them internally by acquiring or setting up its foreign subsidiaries, instead of trading these assets in the external market. More specifically, the external market is imperfect. The transactions are costly particularly for intangible assets such as brand, technology and managerial know-how, since the costs of searching for buyers and technology leakage are high. To reduce the transaction costs and maximise profits, MNEs prefer to internalise the transactions and create an intermediate market (e.g., intermediate input such as technology, managerial and marketing skills) within the MNE hierarchy. As an extension of the MNE structure, setting up foreign subsidiaries can help MNEs reduce transaction costs and make above normal profit,

while maintaining control of its valuable intangible assets.

Accessing the cheaper inputs in overseas countries is another benefit of international diversification. The MNE is attracted and willing to invest its money in selected host countries. The location decisions might be influenced by a number of country characteristics that include, but are not limited to, low labour force, cheap natural resource, market size and income level (Dunning, 1988).

Liabilities of foreignness and newness focus on the negative side of international diversification. There are costs of doing business in foreign countries (Hymer, 1976). The main costs are liabilities of foreignness and newness. Liability of foreignness suggests that an MNE cannot operate as effectively as a local firm and tends to make more mistakes in business decisions. This is a result of their unfamiliarity with local culture, lack of local information and governments' discriminatory treatment (Zaheer, 1995). Liabilities of newness suggests that new organisations have a greater failure risk than old organisations, due to their low legitimacy and dependence on cooperating with strangers, because they have to employ staff, install facilities, establish external business networks and internal management systems from scratch (Stinchcombe, 2000; Lu and Beamish, 2004). Finance scholars study the costs of international diversification and provide some evidence for the MNEs' market value discount. Also, based on the agency theory (Jensen, 1986), it is argued that the manager tends to obtain increased remuneration by augmenting the firm size through overseas expansion strategies that can be value-destroying (Denis et al., 2002).

Foreign expansion helps firms learn foreign knowledge and gain international experience (Johanson and Vahlne, 1977). Internationalisation is an incremental, path-dependent organisational process, and is influenced by the firm's international experience and previous learning (Hamel, 1991; Barkema et al., 1996; Eriksson and Penker, 2000). A firm will first enter overseas countries that are similar to their home countries in terms of culture and institution, where the liability of foreignness is small. In this way, the firm can enjoy various multinational benefits such as

economies of scale and learning knowledge, providing the MNE with a competitive advantage over domestic firms who might not have access to these benefits. The crucial kind of knowledge is experiential knowledge, including market-specific knowledge and general internationalisation knowledge. Learning these two kinds of knowledge could be reflected in enhanced services and products, leading to the MNEs' superior performance over domestic firms (Johanson and Vahlne, 1977).

However, the firm will then enter overseas countries with unfamiliar culture and institutions, increasing the coordination costs of managing foreign subsidiaries in the diverse geographic markets. After a turning point, the marginal cost will exceed the marginal benefits, leading to poor performance at a high degree of international diversification. This rationale suggests a curvilinear form of the relationship between multinationality and performance (Li, 2007). There are some other international diversification benefits. The risk reduction effect advocates that firms can spread investment risk over diverse countries so as to reduce the fluctuation of revenues (Kim et al., 1993). Real options theory argues that the MNEs regard jointly owned subsidiaries as options. The MNE can exercise the option by buying out or selling the shares of a joint venture when favourable circumstances occur (Belderbos et al., 2014).

Overall, the exploitation of FSA in overseas countries emphasises the benefits and motivations of internationalisation. The liabilities of foreignness and newness focus more on the costs of doing business abroad. The learning benefits highlight the dynamic internationalisation in the incremental organisational learning process. The relationship between multinationality and performance is the dynamic effect of the benefits and costs of multinationality. These are the theoretical arguments of benefits and costs in the international diversification literature, and are used in the international diversification chapter of this PhD thesis. We seek to explain in which country (developed vs. developing countries) the firm should invest so as to obtain greater economies of scale and achieve greater gain in firm performance, through exploiting the FSA.

1.4 Product Diversification

In the past four decades, several theories or literature have been developed to explain why the firm diversifies into different product markets. Economies of scope, internal market efficiency and market power advantage are the important diversification benefits emphasised in the product diversification literature.

Economies of scope, also called Synergies, are widely used in strategy literature to explain the rationale of firm's adoption of a product diversification strategy. Compared with economies of scale, economies of scope emphasise efficiencies gained from variety and not from volume (Goldhar and Jelinek, 1983). Product relatedness among different product divisions determines the extent to which the diversified firm can benefit from economies of scope. The utilisation of valuable complementary or similar inputs, including tangible assets (e.g., property, plant and equipment, finance resource) and intangible assets (e.g., know-how, R&D products), by different product divisions, provides the diversified firm with benefits that are not available to the undiversified firm. When the costs of producing two different products within a firm are smaller than the sum of the individual costs of producing them in two separate firms, economies of scope are realised, reducing the per unit production cost for the multi-product firm (Rumelt, 1982; Teece, 1982). For instance, the merger of Travelers Group and Citicorp created economies of scope for the newly merged firm; this is because these two new business units could share the distribution channels (e.g., to sell the financial products of the one by using the sales team of the other) (The Economist, 2008). In addition, economies of scope could also derive from the sales of bundling products, the shared use of marketing activities. For instance, Baker Hughes provides its customers with a range of related products and services (e.g., drilling, making well ready to be used, environment management) through three different but related divisions. Texas Instruments' several product divisions share the R&D centre and production facilities to achieve cost efficiencies. Compad introduces workstations to achieve production economies since this product can complement Compad's core product - personal computers (Palich et al., 2000).

Internal factor market efficiency is proposed in institution and finance literature to explain the firm's corporate diversification plan (Palich et al., 2000). A multi-business firm can create an internal capital market by cross-subsidising its separate product divisions (McCutcheon, 1992; Schmid and Walter, 2009). The diversified firm/conglomerate not only attracts external financial resources (debt and equity) for firm expansion, but also creates internal financial resources that are available to different product divisions. More specifically, the diversified firm can shift the capital among business units within the subsidiary portfolio. This financial efficiency is not available to the single-business firm, who is not able to use cross-subsidization (Lang and Stulz, 1994).

Apart from the financial flexibility, headquarters have information superiority over external firms. When it comes to the performance and potential of the business unit, there is an information asymmetry between the headquarters and the external firm. The headquarters of the diversified firm has better access to its business unit's information. Therefore, the headquarters can effectively shift the cash from a mature and well-performing business unit (i.e., cash cow) to the new start-up business unit - who has great potential but lacks the initial capital (Servaes, 1996). However, other scholars argued that internal capital and labour market is inefficient when poorly managed by the headquarters. For instance, according to the agency theory, to maximise the manager's personal interest (e.g., the high remuneration associated with the large firm size) at the expense of the shareholder's interest (e.g., the maximised profit and firm value), the manager tends to overinvest any available free cash flow in the new investment projects that might have little potential and would be unprofitable in the future (Jensen, 1986). In addition, the improved regulation and information technology in recent years diminish the benefits of the internal factor market (Markides, 1992).

Market power advantage is contended by the industry organisation literature (Palich et al., 2000; Bausch and Pils, 2009). The multi-business firm can generate and enhance the market power advantage, while the single-business firm is unlikely

to do so (McCutcheon, 1992). For instance, the diversified firm can employ predatory pricing (i.e., charge a much lower price for its products) to force the current competitors out of the market or threaten potential new entrants. Predatory pricing can be funded by cross-subsidisation among business units, and its short-term loss can be offset by a long-term higher price in the future when the diversified firm becomes the dominant or sole player in this market (Caves, 1981; Saloner, 1987; Berger and Ofek, 1995). In addition, the diversified firm's reciprocal buying and selling with its suppliers or customers could enhance market power advantage. Product diversification increases the likelihood of reciprocity, since the diversified firms might establish a new product division that can provide its current supplier with the needed product that was not previously offered (Scherer, 1980; Grant, 1998; Palich et al., 2000). However, some scholars argue that firms seldom use predatory pricing in reality, and the more focused firm can also benefit from adopting predatory pricing (Scherer, 1980; Geroski, 1995; Palich et al., 2000). There are some other theories in the product diversification literature. The portfolio effects emphasise the advantage of more stabilised revenue streams due to the imperfect correlations among different business units. This coinsurance effect leads to reduced bankruptcy risk, improved debt ranking and capacity.

Overall, these theoretical arguments for diversification benefits contribute to the different aspects of product diversification research. Economies of scope (synergy effect) explains how the diversified firm benefits from the product relatedness among various products, and analyses how to diversify into different businesses; internal factor market efficiencies suggests that the headquarters possess superior access to the information of the new business unit's performance and potential, leading to greater efficiency of internal capital market than the external market; market power advantage seeks to explain how product diversification increases the firm's market power, by predatory pricing, cross-subsidisation, reciprocal buying and selling, and the establishment of entry barrier.

Economies of scope (synergy effect) are the key benefit in the product diversi-

fication literature, and are employed in the product diversification chapter in this thesis. We aim to examine into which industry the firm should diversify in order to achieve a greater synergy effect and obtain additional gain in firm performance, through the utilisation of complementary or similar resources and skills by the core business and other business.

1.5 Firm Performance

There is a growing literature on firm diversification (international and product diversification) and performance in the past four decades. Market-based and accounting-based variables have been used in the diversification literature. For instance, market-based variables include Tobin's Q and excess value. Accounting-based variables include return on equity (ROE), return on assets (ROA) and return on sales (ROS). Market-based variables are not available for all economies. There is a problem of severely decreased sample size if we use market-based variables. Therefore, market-based variables are ruled out. Return on assets has been widely used in the previous diversification-performance literature (Mayer and Whittington, 2003; Lu and Beamish, 2004; Ruigrok and Wagner, 2004; Qian et al., 2008; Chao and Kumar, 2010; Lin et al., 2011; Benito-Osorio et al., 2015; Berry and Kaul, 2016). In addition, return on sales, return on equity and return on assets are highly correlated, generating similar results (Tanriverdi and Venkatraman, 2005; Benito-Osorio et al., 2015). Thus, this thesis uses profitability (i.e. return on assets), defined as the net income divided by total assets, to measure firm performance in the diversification chapters 2, 3 and 4. This also helps to compare our results with previous studies' results.

The performance measures vary across the foreign acquisition premium literature. One common measure is cumulative abnormal returns. However, this market-based measure is abandoned since stock market data are lacking and not available for all countries. The most standard approach to measure performance is total factor productivity (Bertrand and Zitouna, 2008; Balsvik and Haller, 2010; Geluebcke,

2015; Liu, Lu and Qiu, 2017), despite its difficulty in calculation. Following previous studies, this thesis employs productivity (i.e. total factor productivity) to measure target firm performance in the foreign acquisition premium chapter 5.

1.6 Overview of each chapter

This PhD thesis consists of five chapters, including three empirical chapters. Chapter 1 is the introduction chapter. It provides the context, motivation of the research and overview of each chapter. Chapters 2-4 are empirical chapters. They could be categorised into two parts. Part I (Chapters 2-4) is about the potential effects of diversification, whether international (multinationality) or product. Part II (Chapter 5) links the three chapters in Part I through location.

Chapter 2 seeks to examine the relationship between international diversification and firm performance in the emerging economy[1] context. Further, we aim to investigate whether the location decision (developed[2] vs developing[3] host countries)

[1]These emerging economies include Argentina, Bahrain, Brazil, Bulgaria, Chile, China, Colombia, Czech Republic, Egypt, Estonia, Greece, Hong Kong, Hungary, India, Indonesia, Israel, Jordan, Kuwait, Latvia, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Qatar, South, Korea, Romania, Russia, Saudi, Arabia, Singapore, Slovakia, Slovenia, South Africa, Sri, Lanka, Thailand, Turkey, Ukraine, UAE, Vietnam. To capture the largest possible country coverage of the emerging economy group, the country grouping is based on definition by several institutions (IMF, BRICS+NEXT Eleven, FTSE, MSCI, S&P, EM bond index, Dow Jones, Russell, Columbia University EMGP) and prior study (Bebenroth and Hemmert, 2015).

[2]The developed economies include Aruba, Andorra, United Arab Emirates, Bahrain, The Bahamas, Bermuda, Barbados, Brunei, Channel Islands, Curacao, Cayman Islands, Cyprus, Faeroe Islands, Equatorial Guinea, Greenland, Guam, Hong Kong SAR, China, Croatia, Isle of Man, St. Kitts and Nevis, Kuwait, Liechtenstein, Macao SAR, China, St. Martin (French part), Monaco, Malta, Northern Mariana Islands, New Caledonia, Oman, Puerto Rico, French Polynesia, Qatar, Saudi Arabia, Singapore, San Marino, Sint Maarten (Dutch part), Turks and Caicos Islands, Trinidad and Tobago, Virgin Islands, Australia, Austria, Belgium, Canada, Switzerland, Czech Republic, Germany, Denmark, Spain, Estonia, Finland, France, United Kingdom, Greece, Hungary, Ireland, Iceland, Israel, Italy, Japan, Korea, Luxembourg, Netherlands, Norway, New Zealand, Poland, Portugal, Slovak Republic, Slovenia, Sweden, United States. The country grouping is based on World Bank (2013).

[3]The developing economies include Afghanistan, Burundi, Benin, Burkina Faso, Bangladesh, Central African Republic, Comoros, Eritrea, Ethiopia, Guinea, The Gambia, Guinea-Bissau, Haiti, Kenya, Kyrgyz Republic, Cambodia, Liberia, Madagascar, Mali, Myanmar, Mozambique, Mauritania, Malawi, Niger, Nepal, Democratic People's Republic of Korea, Rwanda, Sierra Leone, Somalia, Chad, Togo, Tajikistan, Tanzania, Uganda, Dem. Rep. Congo, Zimbabwe, Albania, Armenia, Belize, Bolivia, Bhutan, Cote d'Ivoire, Cameroon, Congo, Cape Verde, Djibouti, Egypt, Fiji, Micronesia, Georgia, Ghana, Guatemala, Guyana, Honduras, Indonesia, India, Iraq, Kiribati, Kosovo, Lao PDR, Sri Lanka, Lesotho, Morocco, Moldova, Marshall Islands, Mongolia, Nigeria, Nicaragua, Pakistan, Philippines, Papua New Guinea, Paraguay, Sudan, Senegal,

matters to the international diversification-performance link. Lastly, we seek to examine whether the ownership structure affects the international diversification-performance relationship.

Following our empirical test on how international diversification affects firm performance in Chapter 2, Chapter 3 focuses on how product diversification affects firm performance. Both diversifications are important corporate-level strategies for firm expansion. We investigate the performance difference among firms owing to their different levels of product diversification. Also, we analyse how the product relatedness affects the product diversification-performance link. Further, we distinguish between horizontal and vertical relatedness, as well as upstream and downstream relatedness, to provide a finer classification of product relatedness. We then link this finer classification to the product diversification-performance relationship.

Chapter 4 is a concluding chapter of the analyses on international and product diversifications, which are considered first separately in greater detail, and then jointly, although with lower detail. Chapter 2 and Chapter 3 examine the individual effects of international and product diversifications, while Chapter 4 examines the joint effect of these two diversification strategies. Specifically, in Chapter 4, we investigate the joint effect of international and product diversifications on firm performance. Further, we analyse how the industry context (i.e. high-tech versus low-tech sectors context) shapes this joint effect. Lastly, we examine how the national context (i.e. emerging versus developed country context) shapes this joint effect.

Chapter 5 aims to examine the impact of acquisition type (foreign/domestic) on target a firm's performance based on the data of mergers and acquisitions (M&A)

Solomon Islands, El Salvador, South Sudan, Sao Tome and Principe, Swaziland, Syrian Arab Republic, Timor-Leste, Tonga, Ukraine, Uzbekistan, Vietnam, Vanuatu, West Bank and Gaza, Samoa, Yemen, Zambia, Angola, Argentina, American Samoa, Antigua and Barbuda, Azerbaijan, Bulgaria, Bosnia and Herzegovina, Belarus, Brazil, Botswana, Chile, China, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Algeria, Ecuador, Gabon, Grenada, Iran, Jamaica, Jordan, Kazakhstan, Lebanon, Libya, St. Lucia, Lithuania, Latvia, Maldives, Mexico, Macedonia, Montenegro, Mauritius, Malaysia, Namibia, Panama, Peru, Palau, Romania, Russia, Serbia, Suriname, Seychelles, Thailand, Turkmenistan, Tunisia, Turkey, Tuvalu, Uruguay, St. Vincent and the Grenadines, Venezuela, South Africa. The country grouping is based on World Bank (2013).

projects, considering the moderating role of parent firms' international diversification and home country location. More specifically, we investigate the relationship between acquisition type and target's performance. In addition, we examine how the parent firm's international diversification moderates this relationship. We then analyse how the parent firm's location moderates this relationship.

Finally, Chapter 6 provides concluding remarks of the thesis. It summarises each chapter's main findings, discusses main contributions and provides managerial implications of these findings.

Chapter 2

Location Choice, Ownership Structure and Multinational Performance

2.1 Introduction

The relationship between multinationality and firm performance has remained an important research issue for business scholars over the past three decades (Contractor et al., 2003; Majocchi and Strange, 2012; Yang and Driffield, 2012; Castellani et al., 2017). Multinational enterprises (MNEs) expand operations across foreign countries. Internationalisation results in costs such as unfamiliarity with foreign markets, sunk costs at early internationalisation and great coordination costs. International expansion also benefits firm performance by helping MNEs access cheaper resources, acquire foreign knowledge, realise economies of scale, and exploit firm-specific assets in foreign markets. Overall, the observed multinationality-performance (MP) relationship is the net effect of these costs and benefits (Contractor, 2007).

This paper seeks to link location choice and ownership structure to the debate on the MP relationship in the emerging economy context. The large MP literature mostly relies on the data from developed countries MNEs, and insufficient attention has been given to the emerging economy multinational enterprises' (EMNEs) international activity, while EMNE's foreign direct investment (FDI) motivation and investment patterns are very different from developed MNEs (DMNEs) (Ramamurti, 2012). Moreover, the extant literature tends to focus on whether the MP relationship is linear; it proposes various functional forms by adding second-order or higher-order terms. The studies on developed MNEs find inconsistent empirical results, including insignificant, positive, negative, U-shaped, inverted U-shaped, S-shaped or even M-shaped relationships. However, they generally ignore how important moderators, such as location choice and ownership structure, shape the MP relationship. Drawing on 1,321 emerging economy firms, this paper aims to fill these gaps by providing a better understanding of EMNEs' foreign operations and their performance implications.

FDI location is one important aspect of Dunning's eclectic paradigm (Dunning, 2000). The location advantage of FDI highlights that the MNE is attracted and

willing to invest its money in selected host countries. The location decisions might be influenced by a number of country characteristics that include, but are not limited to, low-cost labour force, cheap natural resources, market size and income level (Dunning, 1988). However, the large literature generally disregards the heterogeneity among different FDI locations and instead chooses an aggregate view of foreign investments. Within a few exceptions (Pantzalis, 2001; Berry, 2006), they did not consider the curvilinear MP relationship when considering location choices. Crucially our data have the information regarding the FDI location. We intend to look into whether the returns to multinationality for EMNEs investing in developed countries are different from those investing in developing countries.

We explore the importance of ownership structure in internationalisation and firm performance. Ownership structure affects FDI motivation and interacts with the home and host environments (Li and Oh, 2016); this will then have an impact on firm's multinational performance (Child and Rodrigues, 2005). The extant MP literature gives limited attention to ownership structure, particularly from an institutional perspective. The multinational network determines that the MNE could be influenced by home and host institutional environments (Xu and Shenkar, 2002). We aim to examine how the multinational performance of MNEs is affected by the interaction between institutional ownerships (private vs. state ownership) and institutional environments in the home and host countries. We compare the performance differences between privately owned enterprises (POEs) and state owned enterprises' (SOEs) when investing in developed countries.

It is argued that international business scholars should increase the use of longitudinal data to better understand the relative change of an MNE's internationalisation over time (Hennart, 2007). To test our hypothesis, we draw on panel data containing 1,321 MNEs from 44 emerging economies over a period from 2004 to 2013.

As in prior related research, we find an inverted U-shaped MP relationship for EMNEs, which seems to be similar to that of DMNEs in some studies (Ruigrok and Wagner, 2003; Qian et al., 2008); however, additional factors matter in EMNEs.

First, although a significant positive effect of multinationality on performance at the initial stage is proved, we find that this positive effect is larger when investing in developed than in developing countries. In addition, we find that the positive effect of investing in a developed country at the initial stage is stronger for POEs than for SOEs. These results indicate that EMNEs' performance benefits a great deal from the enhanced firm-specific advantage (FSA) derived from assets-augmenting FDI in developed countries. This seems to explain why EMNEs tend to invest more in developed countries than in other developing countries (Ramamurti, 2012). Also, these results seem to explain private EMNEs' institutional escapism Li and Oh (2016), and why POEs perform better than SOEs in international operations when facing home institutional push and host institutional pull.

The structure of this paper is as follows. After the introduction section, we provide a review of the relevant literature and develop the hypotheses. Section 3 explains the methodology. Section 4 discusses the regression results. The final section concludes.

2.2 Literature Review and Hypotheses Development

Internationalisation provides firms with many benefits (Castellani and Zanfei, 2006). Going abroad can help firms gain access to resources such as cheap labour force Contractor (2007). Expanding sales by either exporting or investing abroad allows firms to benefit from economies of scale (Krugman, 1980). MNEs may enjoy reduced costs per unit of output because fixed costs can be spread over a large scale of production. MNEs could exploit their firm-specific assets in the foreign countries and earn abnormal profits, through an internalised multinational network (Castellani and Zanfei, 2007; Buckley and Strange, 2011). When investing abroad, a firm can obtain experience and foreign knowledge, which could help MNEs perceive and seize other foreign markets' opportunity, contributing to their superior performance (Johanson

and Vahlne, 1977).

While a number of factors lead to the prediction of a positive effect of multinationality on firm performance, several factors may impose negative impact on profitability. The most important are a lack of international experience and growing coordination costs (Qian, 2002). The coordination and governance costs rise with the increased foreign operation (Lu and Beamish, 2004). When operating in multiple countries, the differing institutions and culture add to the complexity of coordination issues (Sundaram and Black, 1992). Hennart (2007) adopts a transaction cost/internalisation (TCI) model to critique the theoretical background of MP literature, particularly focusing on economies of scale, operational flexibility and learning experience. He argues that there is no direct MP relationship. However, Contractor (2007) contends that Hennart's assumptions about MNEs are too stringent and a TCI lens provides too limited a view, indicating alternative perspectives from strategy and international business literature. Contractor concludes that internationalisation is good for companies.

There is a considerable literature on the MP relationship, but much of it uses data on DMNEs. The empirical results are rather mixed (see a summary of prior 67 studies' findings in Appendix A, Table 2.10-2.11). Some empirical evidence supports that international diversification can enhance firm performance (Kim et al., 1993; Goerzen and Beamish, 2003). However, some papers find a negative relationship (Siddharthan and Lall, 1982; Denis et al., 2002). Recently, scholars have focused more on a non-linear relationship. Some empirical works find a U-shaped relationship (Lu and Beamish, 2001; Thomas and Eden, 2004), while others discover an inverted U-shaped relationship (Hitt et al., 1997; Qian et al., 2008). Alternatively, some scholars propose S-shaped (Contractor et al., 2003), inverted S-shaped (Ruigrok et al., 2007) or M-shaped MP relationships (Lee, 2010). For more summaries of prior study's findings, see the recent meta-analysis of Yang and Driffield (2012).

It can be seen that previous empirical literature provides decidedly mixed evi-

dence of the MP relationship, which may be partly due to the ignorance of important variables such as location and ownership structure which we will consider in this paper. In addition, these findings are mainly based on the analysis of DMNEs (e.g., US firms). A few exemptions (Contractor et al., 2007; Gaur and Kumar, 2009) only focus on one emerging country. We need to further discuss whether these findings can be applied to MNEs from various emerging economies. EMNEs are different from DMNEs with respect to the content of their FSA. The emerging giants from several countries, including Huawei (China) and Infosys (India), have attracted attention from both scholars and managers (Khanna and Palepu, 2006). It is fascinating and interesting for academics to understand why and how EMNEs go international and subsequently perform.

2.2.1 Multinationality-Performance Relationship and Emerging Economy Multinationals

Drawing on Rugman's CSA/FSA framework, this paper aims to provide a better understanding of the MP relationship for EMNEs. This framework is widely adopted in the international business field to analyse the competitive advantages of an MNE. Linking to the internalisation theory (Buckley and Casson, 1976) and resource-based view (Wernerfelt, 1984), CSA/FSA framework (Rugman and Verbeke, 2003) emphasises that the interaction and combination of CSA (e.g., labour force, natural resources) and FSA (strength, capabilities, unique resources) determine an MNE's internationalisation activities and its performance implications. Prior studies have positioned the majority of EMNEs in quadrant 1 (weak FSA and strong CSA) in the CSA/FSA matrix (Li and Oh, 2016).

One may incorrectly conclude that EMNEs do not possess FSA which is usually owned by western MNEs. However, EMNEs do own FSA and we need to consider a broader definition of FSA that a firm can have. Scholars took comparable efforts to identify the non-traditional and unique FSA of EMNEs (Ramamurti, 2009). Based on (Rugman and Verbeke, 2003)'s CSA/FSA matrix, firms internationalise

by leveraging firm-specific advantage (FSA) and country-specific advantage (CSA). EMNEs tend to drive performance by leveraging country-specific advantage rather than traditional firm-specific advantage.

Economies of scale are an important country-specific advantage for EMNEs, as they typically enjoy a large and growing domestic demand base. In addition, EMNEs may have an advantage in the access to some resources (e.g., cheap gas, oil and a cheap semi-skilled labour force). This competitive advantage tends to be location-bound and country-specific (Bhaumik et al., 2016).

EMNEs have non-traditional FSA in the strategic flexibility in coordinating the use of existing resources and producing low-cost goods (Wright et al., 2005). They have strong capability in adapting the available technology to resource-scarce and labour-intensive production (UNCTAD, 2006; Bhaumik et al., 2016). For instance, the competitive advantage of India's IT service industry partly relies on the adaptation of existing communication technology and the abundant supply of educated English-speaking Indian workers who graduate from various engineering education institutes in India (The Economist, 2013). Also, EMNEs have non-traditional FSA that it is argued helps facilitate leveraging CSA across national borders. Internationalisation allows EMNEs to leverage country-specific advantages (e.g., economies of scale) across various foreign countries, augmenting their FSA by leveraging location advantage of host countries, enhancing EMNEs competitiveness and performance in the home country (Bhaumik et al., 2016).

Apart from the developing non-traditional FSA, recently they are also developing the strong FSA owned by traditional western MNEs. In emerging economies, a modern set of knowledge-intensive high-tech sectors that are capital-intensive and skill-dependent have grown in parallel with traditional sectors that depend on labour-intensive and natural resource-intensive activities (Narula, 2015). Unlike the DMNEs that use existing resources to expand abroad, EMNEs expand abroad while creating resources (e.g, acquisition of foreign technology) (CuervoCazurra, 2012). EMNEs can quickly enlarge firm-specific advantage through acquisitions of foreign

strategic assets (e.g., strong brand, technology), if they invest a great deal in their own R&D activity and have high absorptive capacity (Narula, 2015).

Indeed, in recent years, EMNEs have become increasingly able to rely on stronger ownership-specific assets (e.g., latest technology) as a result of the co-evolution of their ownership-specific advantage and the home country's national innovation system (NIS) (Elia and Santangelo, 2017). The development of country-specific advantage (e.g., knowledge and institutional infrastructure such as universities and R&D clusters conducting research in cutting-edge technologies) in the emerging economies has fed the absorptive capabilities of EMNEs. For instance, based on the data from the Financial Times, China has been ranked number 1 in the world for host location of greenfield FDI in R&D projects since 2010 (Fingar, 2015). The emerging economies have experienced an upgrade of their technological capabilities and the large availability of talents (Laursen and Santangelo, 2017). This enables them to better understand and absorb the knowledge acquired in the strategic assets augmenting acquisition in developed countries with a strong NIS context (Elia and Santangelo, 2017). This has also fostered the country-specific advantage, and thus the domestic firms' firm-specific advantage (Laursen and Santangelo, 2017).

Given the fast evolution of EMNEs, recent international business literature suggests that EMNEs are more and more similar to advanced MNEs in terms of strategic behaviour and performance implications. As the EMNEs become more internationalised or more experienced by operating in a large number of countries, their multinationality does not differ greatly from that of DMNEs, leading to a higher similarity between EMNEs and DMNEs (especially in terms of CSA and FSA) (CuervoCazurra, 2012).

We draw on Haans et al. (2016) to have a deeper understanding of how the interplay of costs and benefits shape the effect of multinationality on firm performance. We do this by considering the two latent mechanisms (benefits of multinationality; costs of multinationality) that determine the relationship (net effects of multinationality on firm performance).

On the one hand, the positive effects are derived from foreign operations. EMNEs have their unique firm-specific advantage derived from country-specific advantage; these include scale economies, natural resources, cheap semi-skilled labour, government support in financing and overseas investment (Bhaumik et al., 2016; Li and Oh, 2016). Their FSA includes producing products at ultra-low costs, coordinating the use of existing resource, adaptation skills of the available technology, and ability to utilise and upgrade capabilities (Cuervo-Cazurra and Genc, 2008; Ramamurti, 2012). In addition, due to the enhanced absorptive capabilities fed by improved domestic knowledge and institutional infrastructure, they are able to absorb acquired foreign knowledge and develop traditional FSA (e.g., advanced technology, global brand and good management team) (Laursen and Santangelo, 2017). They are becoming increasingly able to rely on stronger ownership-specific assets (e.g., latest technology) as a result of the co-evolution of their ownership-specific advantage and the home country's national innovation system (NIS) (Elia and Santangelo, 2017). The positive effect is expected to grow at a declining rate, due to the diminishing benefit of FSA when it is overstretched in geographically diverse operations (Tallman and Li, 1996; Hitt et al., 1997).

On the other hand, the negative effects are arising from foreign investment. International operations create managerial complexity due to dissimilar environments such as trade barriers and cultural difference. Coordination problems occur when the firm is operating in unfamiliar foreign environments (Hitt et al., 1997). Managerial complexity increases with multinationality (Grant, 1987), as more intensive foreign operations impose higher requirements on communication and coordination not only between headquarters and overseas subsidiaries, but also among overseas subsidiaries in different countries (Ruigrok and Wagner, 2003). Also, the environmental difference, which increases with the foreign expansion, enhances the risk of misallocation of resources in firm's various markets (Hitt et al., 1994). This negative effect of an international presence would grow at an increasing rate.

Taking these two counteracting forces of foreign operations on firm performance

together, we subtract the convex increasing function from the concave increasing function. The net effect is an inverted U-shaped relationship between multinationality and firm performance. At low levels of multinationality, the positive effect of firm-specific advantage dominates, leading to a positive impact of multinationality on firm performance. In contrast, at high levels of multinationality, the negative effect of accelerating global coordination costs prevails, thus driving a negative impact of diversification on firm performance. Based on the above argument, we propose the following hypothesis.

Hypothesis 1: Multinationality has an inverted U-shaped relationship with firm performance for emerging economy multinationals, such that it has (a) a positive linear effect and (b) a negative quadratic effect on performance.

Considering the possibility that the relative strength of two countervailing effects may vary several times throughout the internationalisation process, which leads to higher function forms such as S-shaped (Contractor, 2007) and inverted S-shaped (Ruigrok et al., 2007) MP relationships, we will test these cubic relationships as a robustness check.

2.2.2 Location Choice

Although we expect the same kind of MP relationship (i.e. inverted U-shaped) for EMNEs relative to DMNEs, additional factors will be relevant in EMNEs, including location choice and ownership structure. To draw a conclusion regarding the MP relationship, most studies discuss internationalisation costs and benefits, and regress the performance measure on different proxies of the multinationality measure. However, the literature generally uses an aggregate measure to examine the multinationality, ignoring the heterogeneity of FDI locations (Beugelsdijk et al., 2010). Yang and Kwong (2013) find that the returns from foreign direct investment are determined by the economic distance between the home and host country. A few papers (Pantzalis, 2001; Berry, 2006) examining the role of location on the MP relationship consider the differences between developed and developing countries.

Doukas and Travlos (1988)'s results indicate that if a US MNE acquires a firm in an unfamiliar country, this cross-border acquisition can improve the value of the MNE, suggesting that good location choice enhances firm performance. However, they did not find curvilinear MP relationship when considering location choice.

Much research has been done with respect to the FDI flows from developed country to developing countries, an FDI pattern predicted in product cycle hypothesis (Vernon, 1966; Ramamurti, 2012). However, the opposite FDI pattern, namely from developing countries to developed country, has not received enough attention. Further, this opposite FDI pattern could not be explained by an incremental internationalisation process model (Johanson and Vahlne, 1977). EMNEs from some emerging economies tend to invest more in developed countries (dissimilar to home) than in other developing countries (similar to home) (Ramamurti, 2012). Therefore, we need a more promising explanation of EMNEs' FDI location choice. Also, particular attention should be given to the EMNEs' FDI motivations in developed countries.

It is important to distinguish between assets-exploiting FDI and assets-augmenting FDI. The assets-augmenting FDI has become increasingly important in recent years, particularly among emerging economy MNEs. On the one hand, the assets-exploiting FDI prevails among the investments in developing countries. MNEs exploit their firm-specific assets in the developing countries and establish competitiveness in these countries Dunning (2000). On the other hand, the assets-augmenting FDI dominates among the investments in developed countries. EMNEs acquire foreign strategic assets in the developed countries with the aim of strengthening their capabilities (e.g., technology, marketing and managerial capabilities), leading to enhanced competitiveness and market position in the home countries or other countries Meyer (2015). This explains why EMNEs often adopt a high commitment mode such as acquisition to enter a new market, instead of low commitment and low-risk choice such as establishing sales subsidiaries (Madhok and Keyhani, 2012; Ramamurti, 2012).

The extent of knowledge emerging country firms learn through international expansion in developed countries is positive and pronounced. A meta-analysis by Yang and Driffield (2012) finds that developing country firms are, on average, away from the technology frontier, and could learn customer or segment information in overseas markets, leading to a great improvement in technological capability and knowledge know-how. This finding is in line with reverse knowledge transfer literature that states that countries with high technological capabilities can transfer knowledge back to their headquarters, leading to productivity improvements (Driffield et al., 2016).

Again, we employ Haans et al. (2016)'s approach and with particular consideration given to the two counteracting latent mechanisms (benefits of FDI to developed countries; costs of FDI to developed countries) that determine the relationship (net effect of foreign presence in developed countries on firm performance).

On the one hand, the firm's enhanced FSA resulting from asset-augmenting FDI in developed countries Makino et al. (2002) reinforces the positive effect of foreign operations on firm performance. Through acquiring firms in developed countries to augment strategic assets (e.g., foreign technology, brand and managerial skills), EMNEs have the opportunity to develop their own intangible assets (e.g., technological capability, marketing skills) under the strong protection of intellectual property in developed countries. This is nearly impossible in the home country context where the poor intellectual property enforcement discourages firms from investing in R&D and creating new products (Gaur and Kumar, 2009). As an EMNE holds a geographically diversified portfolio with strong presence in developed countries, its performance is likely to benefit from the increased competitiveness and enhanced FSA to be exploited in the foreign and home markets (Ramamurti, 2012). These effects tend to sharpen the benefit curve at low levels of multinationality and smooth it down at high levels of multinationality; this is because FSA is becoming increasingly overstretched over the geographically diversified operations. This is illustrated by the strengthened latent mechanism of multinationality benefits. In contrast,

the attractiveness of developing countries is characterised by cheap labour and raw materials, which largely resemble that of the home country (Berry, 2006). Therefore, the benefits of a reduction in production costs for a developing country firm through investing in other developing countries are small (Qian et al., 2008). Also, it is less likely to enhance FSA through acquiring strategic assets in developing countries where there are less abundant assets of this type. Therefore, the benefits are less for EMNEs investing in developing countries.

On the other hand, the negative effect on firm performance increases faster at high levels of multinationality when EMNEs invest in developed countries. A greater foreign presence in developed countries makes the coordination more likely to be complex; this is due to the increasing differences in economic environment and locational factors among developed countries (Qian et al., 2008). Consequently, we could expect a steeper costs curve, where the costs increase much more rapidly when moving to high multinationality. This could be illustrated by the sharper latent curvilinear mechanism of multinationality costs.

Subtracting such negative effects from positive effects of foreign operations in developed countries generates an inverted U-shaped MP relationship. When comparing the net effect of multinationality in developed countries with that of the baseline model, it indicates the different turning points of the two MP relationships. The turning point tends to shift to the left, together with the steepening inverted U curve, suggesting that the peak firm performance will occur earlier when investing in developed countries.

Hypothesis 2a: Multinationality has a larger positive effect on performance for emerging economy multinationals' investment in developed countries than in developing countries.

Hypothesis 2b: This positive effect of the investment in developed countries will switch to negative at lower levels of multinationality.

2.2.3 Ownership Structure Effects

The final concern of our paper is the ownership structure's important role in the MP relationship, which is insufficiently examined in the extant MP literature (Al-Obaidan and Scully, 1993). The multinational structure determines that the MNE can be affected by the institutional environment in the home and host countries (Xu and Shenkar, 2002). Institutional ownership (private vs. state ownership) plays a vital role in EMNEs' internationalisation (Child and Rodrigues, 2005). State owned enterprises account for many listed firms in several countries such as in China and Singapore (Claessens and Fan, 2002). Among the large firms from the 27 wealthiest economies where privatisation is not finished, 18% are State-owned. State ownership is more common in countries with bad shareholder protection, which is more likely to be the case in emerging economies where the institution is weak (La Porta et al., 1999). Both POEs (privately owned enterprises) and SOEs (state owned enterprises) are increasingly engaging in internationalisation activities (Ralston et al., 2006). It is interesting to understand their internationalisation activity and its performance implications. Previous empirical studies show that state ownership has a negative or non-linear relationship with firm's performance (Qi et al., 2000; Tian, 2001). However, there is insufficient evidence regarding state owned enterprise's multinational performance.

FDI motivations play a pivotal role in EMNEs' international activities and their performance (Guillén and García-Canal, 2009). POEs tend to have commercial objectives (e.g., escape motive). They seek to escape the poor institution and constraints of their home country and explore for a better host country condition (location-specific advantage). Most POEs are relatively small and constrained by an adverse competition environment in the home market (Boisot and Meyer, 2008). Thereby, they are more willing to escape this environment, realising economies of scale in a wider global market. POEs' foreign activities tend to be motivated for economic reasons, suggesting that POEs internationalise for value-adding activities (Lin, 2010). This brings benefits to the host country, including spillover efficiency

benefits (Globerman and Shapiro, 2009). Therefore, compared with SOEs, POEs' FDI activities face less host government discrimination.

SOEs are less likely to have an escape motive since their embeddedness in the political system and their relationship with government guarantees access to domestic financial resources (Li and Oh, 2016). Instead, SOEs have non-commercial objectives. As SOEs' state ownership conflicts with the dominant ideology in the host country where the market force dominates the economy, their non-commercial objectives may damage the economic infrastructure, imposing costs and risks to the host country (Globerman and Shapiro, 2009). SOEs have to earn legitimacy, as institutional pressures on SOEs are particularly strong when they enter developed countries that have a strong institutional environment (La Porta et al., 1999; Meyer et al., 2014). SOEs' foreign acquisition projects are more likely to be restricted by the host government (Cui and Jiang, 2012). Therefore, SOEs are more likely to enter the developed countries through greenfield investment (Meyer et al., 2014).

We compare the MP relationships for EMNEs with two types of ownership, namely private and state ownership. EMNEs' investment in developed countries has been of particular interest since the recent pivotal phenomenon of POEs' institutional escapism and SOEs' investment in developed countries (Li and Oh, 2016). On the one hand, we maintain that the positive effect of multinationality in investment in developed countries is strengthened for POEs. The extent to which POEs and SOEs escape from home country institutional pressure is different. POEs' goals conflict with those of the home government and complement those of the host government (Li and Oh, 2016). POEs have the incentive to escape from poor home conditions (institutional constraints such as limited access to financial resources, political instability such as a massive negative consequence from allying themselves with the wrong' political parties, and poor intellectual property protection) and look for better host conditions; this is also called POEs' institutional escapism (Witt and Lewin, 2007; Cuervo-Cazurra et al., 2015; Luiz et al., 2017). By investing abroad, POEs not only avoid the poor institution that limits their development in their

home countries, they also gain efficiency improvement from operating at an international scale and develop their FSA by acquiring strategic assets in the host country (Cuervo-Cazurra et al., 2015). Therefore, POEs could be more efficient in exploring foreign countries and benefit more from international operations than SOEs.

The positive effect of multinationality on investment in developed countries is smaller for SOEs. SOEs are embedded in the political systems and can leverage their relationship with the government to mitigate the negative effect of a weak home institutional environment. SOEs' internationalisation goals complement those of the home government and conflict with those of the host government. SOEs are therefore less likely to escape from the home country (Li and Oh, 2016). SOEs may have other non-commercial objectives, such as public policy goals, establishing a foothold, securing crucial natural resources for the home economy and acquiring advanced technology which may be passed to other SOEs in the military sector (Meyer et al., 2014). These non-commercial objectives impose costs and risk to the host country. The host country tends to resist or discriminate against foreign SOEs' investment (Globerman and Shapiro, 2009). To overcome distrust, SOEs are inclined to adapt their foreign entry strategies to the host's institutional pressure. SOEs are less likely to employ acquisition as the establishment mode, and more likely to adopt a low ownership control mode relative to POEs (Meyer et al., 2014). Therefore, SOEs tend to be less able to benefit from the enhanced FSA derived from the acquisition of foreign technology, and the larger internalisation benefits resulting from a high ownership control mode. The positive effects for POEs and SOEs are both expected to grow at a decreasing rate, due to the diminishing benefits of FSA when overstretched in geographic diverse operation.

On the other hand, the negative effect of multinationality is smaller for POEs than SOEs. Compared with SOEs that face host country discrimination due to their non-commercial objectives, POEs tend to enjoy host institutional pull and face less host country discrimination due to their commercial objectives (e.g., profitability) which are regarded as beneficial to the host economy (Globerman and Shapiro,

2009). The negative effects for POEs and SOEs are both expected to rise at an increasing rate; this is because of the accelerating coordination costs and risk of resources misallocation in geographic diverse markets.

The differences of multinationality benefits and costs between POEs and SOEs lead to the different turning points of quadratic net effects. The positive effect of multinationality on performance is strengthened for firms under control of private ownership. It sharpens the benefits curve of POEs at a low multinationality level, and smooths it down at a high multinationality level. The negative effect is weakened for privately owned firms. The costs curve for POEs is increasing at a lower rate compared with SOEs. The turning point shifts to the right for POEs relative to SOEs when investing in a developed country. Our research model is presented in Figure 2.1.

Hypothesis 3a: Multinationality has a larger positive effect on performance for privately owned enterprises than for state owned enterprises when investing in developed countries.

Hypothesis 3b: This positive effect will switch to negative at higher levels of multinationality for privately owned enterprises relative to state owned enterprises.

2.3 Method

2.3.1 Data

Company data are collected from Orbis data set whose information is maintained by a consultancy called Bureau van Dijck. It provides MNEs' detailed accounting information, parent-subsidiary ownership links, and locations of subsidiaries. We select EMNEs that have an ownership stake of minimum 10.01% (Bureau of Economic Analysis US Department of Commerce., 1999)of its foreign subsidiaries and have information about subsidiaries' location. Such that, we can calculate a key explanatory variable MULT (multinationality, calculated as overseas/total

subsidiaries). Information is available from 2004 to 2013.

We select firms that have data available on return on assets, employees, leverage, sales, parent's ownership structure, parent's ownership stake of subsidiaries and their locations. Country-level data (GDP per capita and GDP growth, institution) are collected from World Bank. Firms with any missing value for one of these variables are excluded. In this panel data, on average, each firm has 3.2 years observations. All monetary measures are reported in US dollars. The final sample includes 1,321 firms with 4,227 observations from 44 emerging economies. Our panel data have advantage since it allows us to exam the dynamic relationships within the data, which is not possible within pure cross-sectional data in many prior studies (Wooldridge, 2010).

2.3.2 The Empirical Specification

Multiple regression models with fixed effects estimators are employed. Following the empirical specification of several scholar's works (Contractor et al., 2003; Ruigrok et al., 2007), we use multiple regression models to test the above three hypotheses. We compare the fixed effects estimates and random effects estimates using misspecification test. The results reject random effects application (Hausman, 1978). Thus multiple regression models with fixed effects estimators are employed.

To examine the inverted U-shaped MP relationship (hypothesis 1), the following equations are presented.

$$Y_{it} = \beta_1 MULT_{it} + \beta_2 MULT_{it}^2 + \lambda X_{it} + \gamma_t + \epsilon_{it} \tag{2.1}$$

$$Y_{it} = \beta_3 MULT_{it}^{D'ED} + \beta_4 MULT_{it}^{D'ED2} + \beta_5 MULT_{it}^{D'ING} + \beta_6 MULT_{it}^{D'ING2} + \lambda X_{it} + \gamma_t + \epsilon_{it} \tag{2.2}$$

It is important to include the second-order term in the equation. A significant negative β_2 indicates an inverted U-shaped relationship, while a significant positive β_2 suggests a U-shaped relationship (Meyer, 2009; Lind and Mehlum, 2010; Haans

et al., 2016).

To examine the impact of location decision and ownership structure on MP relationship (hypotheses 2-3), the following equation is introduced.

We again include the second-order terms of ($\text{MULT}^{\text{D'ED}}$ and $\text{MULT}^{\text{D'ING}}$) in equation 5 to test the curvilinear MP relationship when considering location choice. The main focus is the term β_4 with respect to hypotheses 2-3. The main variables in the above equations are explained as follows.

Dependent variable. Y_{it} refers to the firm performance. In this paper, it is measured by return on assets (PERF). Return on assets (the ratio of net income to total assets (Lu and Beamish, 2004) has been widely used in previous MP literature (Lu and Beamish, 2004; Ruigrok et al., 2007; Qian et al., 2008).

Explanatory variables. This paper uses the number of overseas subsidiaries divided by total number of subsidiaries as a proxy for multinationality (MULT) (Yang and Kwong, 2013; Castellani et al., 2017). Scholars use different measures to calculate multinationality. The most common measure is FSTS (foreign/total sales). FSTS does not distinguish between exports and sales from overseas production. Further, after exploiting the data availability of Orbis, we found difficulty in identifying foreign sales subtracting exporting and licensing when using FSTS measure. FATA (foreign/total assets) does not take account of internationalisation through exports and is highly correlated with FSTS (Annavarjula et al., 2006). Therefore, FSTS and FATA are ruled out. Meanwhile, OSTS does not distinguish business production and sales subsidiaries, or take into account the size of the subsidiaries. Though OSTS is not perfect, it is the only feasible measure using Orbis data set because Orbis has the information about the number of subsidiaries and their locations.

In order to capture the effects of different location choices of FDI on MP relationship, particularly considering the developed and developing countries (Berry, 2006) defined by the (World Bank, 2013), we create two more variables, namely $MULT_{it}^{D'ED}$ and $MULT_{it}^{D'ING}$, which are defined as the number of foreign subsidiaries in developed (developing) nations divided by total number of subsidiaries.

The developed (developing) nations are defined as high-income (middle- and low-income) countries in the (World Bank, 2013).

Control variables. Following prior work (Geringer et al., 2000), several variables that are known to affect business performance and be correlated with multinationality are controlled in the empirical models, represented by X_{it}, involving employee count, leverage and sales per worker. Firms with large size (SIZE, measured by employee count) (Zahra et al., 2000) tend to perform better than small firm. Leverage (LEV, defined as the debt-to-equity ratio) (Qian et al., 2008) is expected to have a negative impact on firm performance, since risky debt results in firm's sub-optimal investment strategy. Firms with high labour productivity (PROD, defined as sales divided by employee count) are more likely to have higher performance than firms with low labour productivity (Al-Obaidan and Scully, 1993). Firm age (AGE, calculated as the duration of operation since the firm's date of incorporation), as a kind of experience, may affect the level of learning, international activities and multinational performance (Zahra et al., 2000).

We control firm's home country characteristics, including GDP per capita (ECON) and GDP growth (GROW) (Li and Qian, 2005), retrieved from World Development Indicators (WDI). Home and host institutional dimensions are included since FDI escapes from home countries with poor institution and is attracted to countries with good institution (Li and Oh, 2016). We adopt the widely used Worldwide Governance Indicators (WGI) (Cuervo-Cazurra and Genc, 2008; Driffield et al., 2016) conducted by (Kaufmann et al., 2009). Following prior study (Kolstad and Wiig, 2012), among the six dimensions, we employ voice and accountability in the analysis since it capture the perception of the extent to which the citizens are able to participate in selecting the government, freedom of expression, association and free media (Kaufmann et al., 2009). We also use other dimensions of WGI to measure institution and find similar results (available upon request). Home country institution (HOMI) is measured by voice and accountability for MNE's home countries. Host country institution (HOSI) is measured by the average score of voice and

accountability for MNE's host countries. We take the natural logarithm of employee count, labour productivity, firm age and GDP per capita (plus 1 since the logarithm is not defined for zero) (Majocchi and Strange, 2012) in order to normalise their distribution. In addition, firm performance may be affected by unobserved macroeconomic factors over the period. Therefore, we control time fixed effects Γ (Yang and Kwong, 2013). We also control firm fixed effect (Berry, 2006). Table 2.1 provides definitions and sources of data for the variables included in the empirical models.

2.4 Results

2.4.1 Descriptive Statistics

Table 2.2 shows the descriptive statistics. On average, an emerging economy multinational has 57 percent subsidiaries locating in overseas countries. It sets up 36 percent subsidiaries in overseas developed countries, 22 percent subsidiaries in overseas developing countries. We also find that, on average, return on assets is 5.21%, labour force is 12,663, labour productivity is US$1,141.91 thousand, leverage is 73% and age is 29.47. As shown in the right panel, most of the correlation coefficients are low.

The data cover 177 economies, including 44 home emerging economies[1] and 177 host economies[2] . Table 2.3 presents the home economy list and the mean value for

[1]These 44 emerging economies include Argentina, Bahrain, Brazil, Bulgaria, Chile, China, Colombia, Czech Republic, Egypt, Estonia, Greece, Hong Kong, Hungary, India, Indonesia, Israel, Jordan, Kuwait, Latvia, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Qatar, South, Korea, Romania, Russia, Saudi, Arabia, Singapore, Slovakia, Slovenia, South Africa, Sri, Lanka, Thailand, Turkey, Ukraine, UAE, Vietnam. To capture the largest possible country coverage of the emerging economy group, the country grouping is based on definition by several institutions (IMF, BRICS+NEXT Eleven, FTSE, MSCI, S&P, EM bond index, Dow Jones, Russell, Columbia University EMGP) and prior study (Bebenroth and Hemmert, 2015).

[2]The 177 host countries include Afghanistan, Albania, Algeria, Angola, Antigua and Barbud, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cayman Islands, Central African Republic, Chile, China, Colombia, Congo, Congo Democratic, Costa Rica, Cote d'Ivoire, Croatia, Curacao, Cyprus, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guatemala, Guinea, Guinea-Bissau, Haiti, Honduras, HongKong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel,

key variables by each economy, including PERF, MULT, MULT$^{D'ED}$, MULT$^{D'ING}$ and SIZE. Table 2.6 (in Appendix A) shows the host economy list and key variable subsidiary ownership. Unsurprisingly, the parent are concentrated on large emerging economies, with significant numbers in BRICS economies (a major emerging economies group that includes Brazil, Russia, India, China and South Africa) (Graceffo, 2011), which comprise 33% of all parents in the sample. EMNEs' top host locations (as measured by the greatest number of foreign subsidiaries) are China, Hong Kong, US, British Virgin Islands, Russia, UK, Singapore, Mexico, Netherlands, Poland, Czech Republic, Australia, Germany, Brazil and South Korea.

2.4.2 Regression Results

Regression models with fixed effect estimators are employed. We control for firm and time fixed effects. Table 4 shows the main results. One column represents one model. There are 4,227 observations in the full sample. Most control variables are significant and have the expected signs. For instance, firm size (SIZE) and labour productivity (RPOD) have significant positive coefficients, suggesting large firms and firms with high labour productivity perform better. Moreover, these signs remain largely unchanged across different specifications in Models 1-8.

Models 1-2 in Table 2.4 are to test hypothesis 1. The key variable of our interest is MULT. Following prior work that studies the curvilinear relationship (Chang and Park, 2005), we gradually add the higher-order terms into the models. In Model 1, which assumes the linear relationship, we find a significant positive sign of MULT, suggesting multinationality has positive impact on firm performance.

Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, Macao, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Moldova Republic, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palestinian Territories, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Samoa, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, South Africa, South Korea, Spain, Sri Lanka, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania United Republic, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, UAE, UK, US, Uganda, Ukraine, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

We add squared term of MULT in Model 2 to test the curvilinear relationship. The F-test comparing two models indicates that the Model 2 is significantly (at 10 percent level) better than Model 1 by introducing the squared term of MULT. We find (from Model 2) the negative sign of squared term (significant at 10% level) and positive sign of linear term (significant at 5% level), which suggest there is inverted U-shaped MP relationship. The optimal level is 69.66%. This indicates that EMNEs can benefit from investing in overseas countries initially, although the costs will exceed benefits when the firm has 69.66% subsidiaries locating in overseas countries. Overall, Models 1-2 support the hypothesis 1 and confirm an inverted U-shaped MP relationship for EMNEs. As EMNEs become more experienced, they do not greatly differ from that of DMNEs. EMNEs are increasingly able to rely on stronger ownership-specific assets as a result of the co-evolution of their ownership-specific advantage and the home country national innovation system. Meanwhile, coordination costs are accelerating at high level of multinationality. Hence, it is unsurprising to see that EMNEs have inverted U-shaped MP relationship that is similar to the results of DMNEs (Hitt et al., 1997), but additional factors (e.g., location choice and ownership structure) still matters for EMNEs.

Models 3-8 are to test hypotheses 2a and 2b. We divide MULT into two parts, namely $\text{MULT}^{\text{D'ED}}$ and $\text{MULT}^{\text{D'ING}}$. Models 3-4 and 5-6 show separately the performance implications of developed and developing country subsidiaries. In Models 7-8, when we control for $\text{MULT}^{\text{D'ED}}$, $\text{MULT}^{\text{D'ING}}$ and their higher-order terms, the developed MULT's coefficients have much clearer pattern of positive relationship in linear model and inverted U-shaped relationship in curvilinear model, compared with developing country subsidiaries whose coefficients are not significant. We interpret that developed countries' subsidiaries have a significant positive effect on firm performance. This positive effect will switch to negative at a multinationality of 54.04%. Thereby hypotheses 2a and 2b are supported. Developed countries have abundant technological resource and strong institutional protection on investment and intellectual property. This help EMNEs enhance their FSA by acquiring new re-

sources and competence that are not available in the home country. Their enhanced FSA strengthens the positive effect of multinationality on performance. However, the coordination costs increase faster at high level of multinationality in developed countries, due to the increasing difference in economic environment and locational factors among developed countries. Therefore, the positive effect of developed country subsidiaries will switch to negative at lower level of multinationality.

Table 2.5 is to test hypotheses 3a and 3b, whether ownership structure matters in MP relationship. We rerun equations 1-2, but using two subsamples. The first subsample consists of 1,206 POEs. The second subsample consists of 115 SOEs. The difference in these two numbers is reasonable because SOEs is usually the minority group in emerging economies after economic reform. However, this minority group often plays an important role in emerging economies and are increasingly investing abroad (Ralston et al., 2006).

Models 1-4 report the results for POEs. We again find that investing in foreign countries has a significant positive effect on firm performance at initial stage. The positive linear and negative quadratic term are significant at 5% level and 10% level respectively, suggesting there is an inverted U-shaped MP relationship for POEs. Similar to the results in full sample, setting up subsidiaries in developed countries enhances firm's performance, while investing in developing countries does not have significant effect on firm performance. The turning point is 55.59% for the privately owned enterprises' overseas developed country investment.

Models 5-8 present the results for state owned emerging MNEs. The number of observations drops substantially, which may have implications with respect to the statistical significance of the results. We find no significant linear MP relationship. We find significant quadratic relationship when considering FDI location choice. We find foreign presence in developed countries has an inverted U-shaped relationship with SOEs' performance, whose turning point is 47.89%. Overall, these results indicate that POEs have large positive effect of foreign operation on performance, and this positive effect switch to negative at higher level of multinationality relative

to SOEs. Thus hypotheses 3a and 3b are supported.

To check the robustness of our primary results, we perform several robustness tests. First, in some curvilinear relationships, the relative strength of two counteracting effects might vary several times throughout the range of variable, suggesting higher function forms (e.g., cubic). For instance, in S-shaped relationship, the negative effect dominates at low and high levels while the positive effect dominates at moderate level (Meyer, 2009). To check whether the relationship is perhaps cubic rather than quadratic, following Haans et al. (2016) and Meyer (2009), we added a cubic term and propose the following equation. The results in Model 1 in Table 2.7 (in Appendix A) shows that the cubic term is not significant and did not improve the model fit, thus strongly supporting the quadratic relationship.

$$Y_{it} = \beta_7 MULT_{it} + \beta_8 MULT_{it}^2 + \beta_9 MULT_{it}^3 + \lambda X_{it} + \gamma_t + \epsilon_{it} \tag{2.3}$$

Second, we break the sample period to investigate a possible evolution of the MP relationship over time. Models 2-3 present that there is a U-shaped MP relationship during a period of 2004-2007, while an inverted U-shaped MP relationship over a period of 2008-2013 (though the coefficient on the quadratic term is marginally significant at 15% level). An possible explanation might come from Contractor (2007). They propose the theory of the Stages model which suggest that the firm make losses due to the huge set-up costs at the initial internationalisation stage, obtain profits later because of various benefits of multinationality, and experience again negative performance resulting from accelerating coordination costs when internationalise too much. Therefore, the first part of U-shaped and the second part of inverted U-shape MP relationship might jointly form the S-shaped relationship. They find a U-shaped relationship for the Indian firms in the period 1997-2001, and suggested that this might be the first part of an S-shaped relationship, while the second part (i.e. inverted U-shaped) would have arisen later with the development of the EMNEs. It may well be that our analysis is capturing the second part of this S-shaped relationship.

Given the fast evolution of EMNEs (Elia and Santangelo, 2017), the MP relationship might has evolved over time and EMNEs has experienced the first part in 2004-2007 and reached the second part in 2008-2013. However, our results indicate that the majority of EMNEs and time period (six years out of ten-year time span) may occupy the second part, suggesting an initial upward slope and followed by a downward slope of multinationality's effect on firm performance (an inverted U-shaped relationship). Also, we consider different ownership threshold. We restrict our sample by only including foreign subsidiaries whose minimum 25.01% equity is owned by parent (Yang and Kwong, 2013). The results in Model 4 reaffirm that EMNEs' investment in overseas countries has a positive effect on performance before a certain level of multinationality.

Next, FDI is the strategic decision of firms, so the endogenous issue should be ruled out or alleviated. Perhaps better performing firms could invest more in overseas countries. The use of firm fixed effects can certainly alleviate those problem. Further, we conduct a robustness check by lagging all independent variables years behind the dependent variable and rerun the analysis. Though this method cannot fully resolve the endogeneity issue, it does mitigate the reverse causality problem (Lin, 2014). Models 5-7 shows that, the results of inverted U-shaped MP relationship largely remain in different lag models, including from one lag to three lags models.

In addition, there are potential issues in using the ratio of the foreign subsidiary count to total subsidiaries count. We consider the fact that a firm (A) with one domestic and one foreign subsidiary has the same multinationality as the other firm (B) with 10 domestic and ten foreign subsidiaries. To address this issue, we consider a set of alternative multinationality measure, including OS (the number of overseas subsidiaries), OC (the number of overseas countries), and FSTS (The ratio of majority owned overseas subsidiaries' sales to all majority owned subsidiaries' sales). Models 1-3 in Table 2.8 (in Appendix A) show that there is a U-shaped relationship for developed country subsidiaries when measured by OS, given the negative linear term and positive quadratic term, and the quadratic term is significant. More-

over, we consider alternative performance measures, namely ROS (return on sales), ROE (return on equity), net profit and gross profit. The results in Table 2.9 (in Appendix A) reaffirm the inverted U-shaped MP relationship, particularly in the case of developed countries subsidiaries. Finally, we expand and explore further the effect of ownership structure on the returns from multinationality, particularly by considering POEs' characteristics such as industrial context (high-tech vs. low-tech sectors; manufacturing vs. service sectors) (Mayer et al., 2015; Berry and Kaul, 2016). Generally, these result in Models 5-8 (in Appendix A) support that the significance of inverted U-shaped MP relationship varies across industrial contexts. The turning points also vary for these different types of POEs.

Overall, we regard the results of robustness tests as supportive to our primary finding. Developed country subsidiaries play a more important role in enhancing EMNEs' performance than developing country subsidiaries before a certain level of multinationality.

2.5 Discussion and Conclusions

The extant knowledge on MP relationship has been limited to MNEs from developed economies (mainly US firms) and some specific emerging economy (e.g., India). In this paper we present empirical evidence for MNEs from various emerging economies. Moreover, although location advantage is emphasised in eclectic theory, surprisingly most MP literature disregards the huge differences between developed and developing countries and uses an aggregate multinationality measure. In addition, ownership structure is rarely considered in previous MP studies, while institutional ownerships (private vs. state ownership) plays a vital role in multinational performance. From an institutional perspective, POEs and SOEs are affected differently by home and host institutional environment when they go abroad. Finally, most of the data used in extant MP papers are cross-sectional in nature. This prevents those papers from controlling unobserved firm fixed effects and analysing the dynamic nature of the multinationality over time. These research gaps are filled in

this paper by using a panel data from a sample that includes 1,321 multinationals from 44 emerging economies over a period from 2004 to 2013.

This paper provides new empirical evidence on emerging economy MNEs, contributing to the existing MP literature, highlighting the importance of FDI location and ownership structure. First, our main finding is that while a general positive pattern exists in EMNEs' MP relationship, this positive relationship is strengthened in the case of developed country subsidiaries. These results are to some extent consistent with Berry (2006) and Qian et al. (2008)'s finding, suggesting that investing in developed countries could strengthen the performance enhancement arising from foreign operation.

Our results emphasise the great benefits of foreign operation to EMNEs' performance, particularly for foreign operation in developed countries, before the optimal level of multinationality. EMNEs have their unique FSA that mainly derives from CSA, such as the adaptation skills of the available technology, and the ability to utilise and upgrade the capabilities. EMNEs are also developing western MNEs' traditional FSA (e.g., latest technology, brand and managerial skills) through acquiring foreign strategic assets. The positive effect of FSA help EMNEs realise the multinationality benefits at the initial stage of internationalisation. Therefore, it is unsurprising to find that EMNEs have inverted U-shaped MP relationship that is similar to the results of DMNEs (Hitt et al., 1997). However, additional factors, such as location choice and ownership structure, is relevant in EMNEs. Also, given the possible evolution of MP relationship over time, it may well be that EMNEs' MP relationship has evolved from the U shape during 1997-2001 in Contractor et al. (2007)'s study to inverted U shape during 2004-2013 in our paper. The majority of EMNEs in our analysis might occupy the second part of an S-shaped relationship that is proposed by Contractor et al. (2003).

Moreover, the advanced countries are associated with high technological capability and institutional conditions, and this facilitates the extent of knowledge flows from host country to home country (Martins and Yang, 2009; Driffield et al., 2016),

leading to performance improvement. Hence, regarding the FDI location strategy, emerging market multinationals are advised to set up a moderate number of overseas subsidiaries in developed countries. We find that the positive effect of developed country subsidiaries will switch to negative occurs at certain level of multinationality (54.04%) due to increasing coordination costs. Qian et al. (2008), for instance, find that diversification into a moderate number of developed countries benefits firm performance.

The final results suggest the important effect of ownership structure on EMNEs' multinational performance. It indicates the relative success of POEs in the foreign expansion, compared with SOEs. The positive effect of multinationality is strengthened for the EMNEs who are privately owned. The turning point shifts to higher level of multinationality for POEs (55.59%), compared with SOEs (47.89%). In the face of home country's institutional pressure and host country's institutional pull, POEs are motivated to escape from the adverse institutional environment and benefit from the better conditions in developed countries. In contrast, SOEs are embedded in the favourable home institutional environment and have to adapt their entry strategies when entering developed country due to their poor political image. They are less likely to adopt acquisition as the establishment mode due to the host institutional pressure. Therefore, they are less able to obtain the benefit of the enhanced FSA from the acquisition of foreign strategic assets (e.g., foreign technology). This provides some evidence on POEs' institutional escapism and SOEs' investment in developed countries (Li and Oh, 2016). We believe our findings provide an understanding of EMNEs' internationalisation behaviour. There is a surge of FDI outflow from emerging economies since 2000 (UNCTAD, 2016). We also believe it has some important managerial implications. It helps to explain, for instance, why emerging economy firms are actively investing in developed countries, as well as why POEs are more successful in the expansion to developed countries than SOEs.

Although this paper advances the research on firm's foreign investment behaviour by unveiling its complex performance implications under important underlying fac-

tors such as location choice and ownership structure. This research is not free of certain limitations that may point to interesting further research directions. First, our multinationality-performance study currently focuses on emerging economy multinational enterprise. It may prove interesting for future study to estimate an MP model with data from both emerging economy and developed economy multinational enterprises so as to test for differences between the two groups. In addition, FDI is the strategic decision of firms, so the endogenous issue should be ruled out or alleviated. Perhaps better-performed firms are more likely to go abroad and can afford to establish overseas subsidiaries. Our estimates do not rule out some form of reverse causality. Our analysis also does not rule out some form of sample selection bias. In addition, our analysis covers a period until 2013. Given the rapid and evolving phenomenon of EMNEs, further research could seek to extend our study by repeating the same tests for newer years and investigate the causal relationship between multinationality and performance. Lastly, we have considered the industry context of privately owned firms, such as comparing high-tech/low-tech and manufacturing/service sectors. Future research avenues are encouraged to expand and explored further by considering characteristics of these private owned firms such as size and experience. We leave these topics for further research.

2.6 Tables and Figures

Figure 2.1: The Research Model

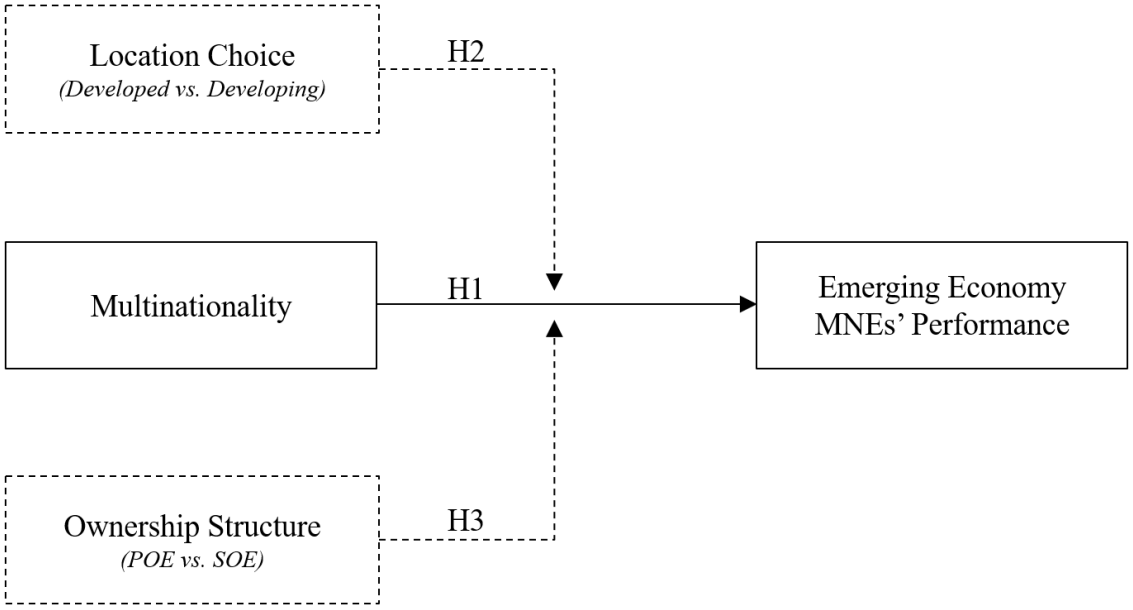


Table 2.1: Operationalization of Variables

Variable	**Operationalisation**	**Source**
PERF	The firm's return on assets using net income (%)	Orbis
MULT	The ratio of the number of overseas subsidiaries to total number of subsidiaries	Orbis
$MULT^{D'ED}$	The ratio of the number of subsidiaries in overseas developed countries to total number of subsidiaries	Orbis
$MULT^{D'ING}$	The ratio of the number of subsidiaries in overseas developing countries to total number of subsidiaries	Orbis
SIZE	The natural logarithm of the firm's number of employees	Orbis
LEV	The firm's debt to equity ratio	Orbis
PROD	The natural logarithm of the firm's sales divided by the number of employees (US$)	Orbis
AGE	The duration of the existence of a firm since the start-up year.	Orbis
ECON	The natural logarithm of the home country's GDP per capita (US$)	WDI
GROW	The home country's GDP growth (%)	WDI
HOMI	The home country's voice and accountability	WGI
HOSI	The average of all host countries' voice and accountability	WGI

Table 2.2: Descriptive Statistics and Correlations Matrix

	Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12
1	PERF	5.21	9.30	1.00											
2	MULT	0.57	0.26	-0.01	1.00										
3	$MULT^{D'ED}$	0.36	0.25	-0.04	0.54	1.00									
4	$MULT^{D'ING}$	0.22	0.24	0.03	0.51	-0.45	1.00								
5	SIZE	7.79	2.13	0.05	0.15	0.09	0.07	1.00							
6	LEV	0.73	0.60	-0.29	0.02	0.02	0.00	0.14	1.00						
7	PROD	12.43	1.30	0.07	-0.02	0.00	-0.02	-0.23	0.11	1.00					
8	AGE	3.11	0.78	-0.01	0.19	0.03	0.17	0.15	0.04	0.02	1.00				
9	ECON	9.31	0.94	-0.08	0.19	-0.02	0.22	-0.24	-0.06	0.15	0.10	1.00			
10	GROW	4.32	5.06	0.11	-0.13	0.04	-0.18	0.28	0.03	-0.08	-0.16	-0.47	1.00		
11	HOMI	0.03	1.00	0.03	0.22	-0.02	0.26	-0.31	-0.11	0.11	0.27	0.54	-0.59	1.00	
12	HOSI	0.31	0.97	0.02	-0.20	0.25	-0.47	-0.13	-0.07	0.04	-0.13	-0.12	-0.04	0.08	1.00

Notes: There are 1,321 emerging economy multinationals and 4,227 observations. All correlation coefficients above 0.10 is significant at over 10% level.

Table 2.3: Number of Firms and Key Variables by EMNEs' Home Economy

Country	N	PERF	MULT	MULT$^{D'ED}$	MULT$^{D'ING}$	SIZE
Argentina	3	11.8	0.43	0.14	0.29	9,064
Bahrain	1	13.51	0.72	0.44	0.28	532
Brazil	28	5.77	0.58	0.31	0.27	24,022
Bulgaria	24	5.75	0.38	0.21	0.17	610
Chile	13	5.04	0.57	0.08	0.49	3,045
China	260	4.33	0.43	0.37	0.07	21,579
Colombia	10	5.1	0.68	0.15	0.53	6,930
Czech Republic	123	6.34	0.47	0.41	0.07	1,885
Egypt	3	17.48	0.69	0.41	0.28	22,965
Estonia	39	5.42	0.55	0.1	0.44	675
Greece	81	2.29	0.63	0.32	0.3	3,309
Hong Kong	87	4.85	0.72	0.32	0.4	17,803
Hungary	11	7.17	0.76	0.4	0.36	7,995
India	62	9.76	0.8	0.55	0.26	23,901
Indonesia	13	3.41	0.51	0.33	0.18	7,840
Israel	36	0.81	0.81	0.66	0.15	2,403
Jordan	2	2.78	0.65	0.4	0.25	80
Kuwait	24	0.76	0.75	0.5	0.25	4,521
Latvia	21	3.44	0.59	0.35	0.24	452
Lithuania	23	8.13	0.53	0.21	0.32	956
Malaysia	20	6.06	0.67	0.46	0.21	19,106
Mexico	18	5.6	0.44	0.23	0.2	26,725
Morocco	2	15.85	0.62	0.06	0.57	12,147
Nigeria	1	2.57	0.71	0.48	0.23	587
Oman	5	4.97	0.56	0.39	0.18	2,999
Pakistan	3	-1.21	0.34	0.05	0.29	2,385
Peru	2	16.92	0.54	0.17	0.38	3,803
Philippines	15	7.49	0.62	0.42	0.2	9,929
Poland	73	7.19	0.52	0.35	0.18	4,958
Qatar	4	12.54	0.57	0.47	0.1	1,929
Romania	10	3.53	0.44	0.13	0.31	7,348
Russia	38	8.05	0.4	0.24	0.16	34,325
Saudi Arabia	10	3.97	0.72	0.44	0.28	6,305
Singapore	30	6.12	0.76	0.34	0.43	22,802
Slovakia	9	3.33	0.46	0.45	0.01	2,090
Slovenia	22	2.54	0.68	0.33	0.34	4,423
South Africa	47	7.6	0.78	0.4	0.38	22,117
South Korea	76	5.06	0.54	0.4	0.14	7,192
Sri Lanka	10	4.24	0.46	0.15	0.31	10,596
Thailand	5	10.31	0.37	0.03	0.34	9,410
Turkey	36	5.13	0.56	0.34	0.22	10,795
UAE	13	2.42	0.76	0.44	0.32	8,859
Ukraine	7	5.92	0.15	0.05	0.1	2,557
Vietnam	1	11.24	0.83	0.17	0.67	1,188

Notes: N is the number of firms. The home countries include 44 emerging economies.

Table 2.4: EMNEs' Multinational Performance; the Role of Location Choice

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MULT	2.5582*	9.9281**						
	(1.408)	(3.945)						
$MULT^2$		-7.1263*						
		(3.744)						
$MULT^{D'ED}$			2.2987	10.8318**			2.9213*	10.9225**
			(1.438)	(4.376)			(1.566)	(4.426)
$MULT^{D'ED2}$				-10.6637**				-10.1055**
				(5.053)				(4.944)
$MULT^{D'ING}$					0.8944	3.0772	2.0329	2.6255
					(1.712)	(4.200)	(1.854)	(4.122)
$MULT^{D'ING2}$						-3.1059		-1.2616
						(4.826)		(4.808)
SIZE	2.2328***	2.2355***	2.2479***	2.2236***	2.2589***	2.2547***	2.2330***	2.2105***
	(0.783)	(0.788)	(0.787)	(0.788)	(0.787)	(0.785)	(0.783)	(0.784)
LEV	-6.3557***	-6.3572***	-6.3444***	-6.3984***	-6.3686***	-6.3832***	-6.3499***	-6.4061***
	(0.681)	(0.678)	(0.681)	(0.680)	(0.682)	(0.682)	(0.681)	(0.679)
PROD	2.3473***	2.3635***	2.3593***	2.3523***	2.3576***	2.3532***	2.3493***	2.3423***
	(0.839)	(0.846)	(0.843)	(0.848)	(0.846)	(0.844)	(0.839)	(0.844)
AGE	-1.3023	-1.5197	-1.5218	-1.4345	-1.3654	-1.3507	-1.3613	-1.2959
	(1.370)	(1.374)	(1.355)	(1.335)	(1.356)	(1.352)	(1.356)	(1.334)
ECON	0.4509	0.3620	0.3873	0.5353	0.3477	0.3502	0.4486	0.5811
	(1.195)	(1.187)	(1.194)	(1.178)	(1.197)	(1.197)	(1.193)	(1.179)
GROW	0.2511***	0.2524***	0.2526***	0.2529***	0.2542***	0.2550***	0.2510***	0.2519***
	(0.069)	(0.068)	(0.069)	(0.069)	(0.068)	(0.069)	(0.069)	(0.069)
HOMI	-3.2832	-3.1484	-3.1043	-3.0587	-3.1126	-3.0920	-3.2559	-3.1825
	(2.129)	(2.120)	(2.115)	(2.091)	(2.139)	(2.134)	(2.141)	(2.114)
HOSI	0.2557	0.2403	0.0279	-0.0485	0.1962	0.2589	0.1935	0.1224
	(0.353)	(0.353)	(0.331)	(0.326)	(0.367)	(0.392)	(0.365)	(0.376)
Adj R-squared	0.135	0.136	0.135	0.136	0.134	0.134	0.135	0.136
No. observation	4227	4227	4227	4227	4227	4227	4227	4227
F statistics	11.850	11.471	12.549	11.912	12.321	11.744	12.164	11.089

Notes: Return on assets is the dependent variable. All models control for firm and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 2.5: EMNEs' Multinational Performance: The Role of Ownership Structure

	(1) POE	(2) POE	(3) POE	(4) POE	(5) SOE	(6) SOE	(7) SOE	(8) SOE
MULT	2.8166*	11.2609**			1.3810	3.5459		
	(1.606)	(4.455)			(1.984)	(5.539)		
$MULT^2$		-8.1080*				-2.1667		
		(4.137)				(5.794)		
$MULT^{D'ED}$			3.3480*	11.3095**			1.0219	9.7232*
			(1.804)	(4.914)			(1.971)	(5.091)
$MULT^{D'ED2}$				-10.1729*				-10.1519**
				(5.546)				(5.039)
$MULT^{D'ING}$			2.0553	2.3824			1.9860	2.7645
			(2.070)	(4.718)			(3.008)	(5.214)
$MULT^{D'ING2}$				-1.0670				-0.6461
				(5.647)				(5.825)
SIZE	2.2123***	2.2220***	2.2095***	2.1698***	1.9906**	1.9806**	1.9704**	2.1051**
	(0.822)	(0.828)	(0.822)	(0.820)	(0.867)	(0.885)	(0.864)	(0.856)
LEV	-6.5385***	-6.5407***	-6.5330***	-6.5899***	-4.6802***	-4.6748***	-4.6968***	-4.6820***
	(0.747)	(0.743)	(0.747)	(0.745)	(1.273)	(1.279)	(1.281)	(1.268)
PROD	2.3228***	2.3416***	2.3230***	2.3168***	2.0778**	2.0821**	2.0519**	2.0396**
	(0.867)	(0.875)	(0.866)	(0.872)	(0.806)	(0.812)	(0.796)	(0.789)
AGE	-1.7907	-1.9875	-1.8970	-1.7611	-1.3722	-1.4693	-1.2966	-1.7421
	(1.827)	(1.820)	(1.811)	(1.803)	(1.517)	(1.561)	(1.486)	(1.440)
ECON	0.2509	0.1196	0.2577	0.3615	1.8995	1.8883	1.9875	2.3259
	(1.400)	(1.388)	(1.400)	(1.387)	(1.611)	(1.617)	(1.762)	(1.685)
GROW	0.2690***	0.2714***	0.2692***	0.2698***	0.1181	0.1152	0.1228	0.1244
	(0.074)	(0.073)	(0.074)	(0.074)	(0.107)	(0.106)	(0.109)	(0.109)
HOMI	-4.3067*	-4.1880*	-4.2874*	-4.2096*	1.2872	1.3493	1.2818	1.2436
	(2.462)	(2.451)	(2.471)	(2.462)	(3.274)	(3.224)	(3.243)	(3.022)
HOSI	0.4588	0.4303	0.3575	0.2478	-0.8333**	-0.8240**	-0.8096**	-0.7206**
	(0.410)	(0.410)	(0.436)	(0.450)	(0.370)	(0.362)	(0.362)	(0.345)
Adj R-squared	0.136	0.137	0.136	0.137	0.213	0.211	0.211	0.216
No. observation	3768	3768	3768	3768	459	459	459	459
F statistics	10.868	10.561	11.159	10.259	3.688	3.636	4.896	4.373

Notes: Return on assets is the dependent variable. All models control for firm and time fixed effects. Models 1-4 include POEs. Models 5-8 include SOEs. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 2.6: Number of Firms and Key Variables by EMNEs' Host Economy

Country	N	Ownership
Afghanistan	2	95.21
Albania	25	83.99
Algeria	14	68.73
Angola	13	78.73
Antigua and Barbud	3	100.00
Argentina	124	69.72
Armenia	10	72.66
Australia	435	87.33
Austria	111	87.10
Azerbaijan	13	67.63
Bahamas	6	82.82
Bahrain	67	66.83
Bangladesh	24	67.98
Barbados	1	100.00
Belarus	27	71.97
Belgium	91	82.77
Benin	5	92.40
Bermuda	107	69.51
Bolivia	4	70.29
Bosnia and Herzegovina	42	74.00
Botswana	51	92.37
Brazil	360	68.99
British Virgin Islands	1076	88.36
Brunei	12	79.62
Bulgaria	290	79.30
Burkina Faso	3	73.83
Burundi	1	100.00
Cambodia	18	73.28
Cameroon	8	81.52
Canada	178	71.94
Cayman Islands	220	78.27
Central African Republic	1	100.00
Chile	134	78.56
China	3605	71.35
Colombia	78	63.63
Congo	9	93.52
Congo Democratic	7	64.42
Costa Rica	12	68.90
Cote d'Ivoire	8	77.91
Croatia	66	78.52
Curacao	10	90.30
Cyprus	304	89.36
Czech Republic	438	84.97
Denmark	38	65.37
Djibouti	3	60.00
Dominican Republic	8	65.14
Ecuador	18	72.78

Number of Firms and Key Variables by EMNEs' Host Economy [Cont's]

Country	N	Ownership
Egypt	130	76.63
El Salvador	7	83.33
Estonia	156	72.62
Ethiopia	2	75.38
Fiji	2	91.83
Finland	37	75.17
France	171	82.12
Gabon	2	50.78
Gambia	1	40.00
Georgia	21	75.55
Germany	413	84.25
Ghana	25	79.73
Gibraltar	4	86.39
Greece	264	61.53
Guatemala	14	64.65
Guinea	4	71.14
Guinea-Bissau	2	88.75
Haiti	1	50.01
Honduras	7	81.77
Hong Kong	1434	86.07
Hungary	119	81.63
Iceland	3	66.17
India	312	65.33
Indonesia	318	77.73
Iran	10	56.15
Iraq	10	62.56
Ireland	67	84.69
Israel	84	69.24
Italy	134	80.62
Jamaica	3	54.27
Japan	132	77.54
Jordan	44	71.95
Kazakhstan	56	70.68
Kenya	32	79.35
Kosovo	7	66.61
Kuwait	59	38.44
Kyrgyzstan	5	50.20
Laos	9	71.56
Latvia	118	84.78
Lebanon	41	93.37
Lesotho	14	92.43
Liberia	83	90.39
Libya	6	62.68
Liechtenstein	2	69.99
Lithuania	132	83.38
Luxembourg	68	82.90
Macao	67	79.29
Macedonia	42	81.90
Madagascar	1	100.00

Number of Firms and Key Variables by EMNEs' Host Economy [Cont's]

Country	N	Ownership
Malawi	13	91.45
Malaysia	333	73.03
Maldives	16	61.41
Mali	8	62.36
Malta	43	93.32
Marshall Islands	16	89.20
Mauritania	3	78.62
Mauritius	161	78.22
Mexico	537	70.97
Moldova Republic	15	73.71
Monaco	3	90.80
Mongolia	15	62.40
Montenegro	15	79.69
Morocco	28	82.94
Mozambique	26	85.79
Myanmar	15	66.35
Namibia	90	80.18
Nepal	6	71.69
Netherlands	492	86.52
New Zealand	67	85.50
Nicaragua	5	91.33
Niger	1	49.00
Nigeria	45	80.42
Norway	44	86.41
Oman	57	69.10
Pakistan	39	65.11
Palestinian Territories	6	80.47
Panama	101	75.87
Papua New Guinea	14	80.49
Paraguay	5	71.54
Peru	84	74.44
Philippines	134	64.57
Poland	477	77.42
Portugal	26	91.97
Qatar	62	64.91
Romania	252	81.90
Russia	918	76.22
Rwanda	4	70.35
Samoa	14	94.93
Saudi Arabia	114	58.83
Senegal	4	92.90
Serbia	110	79.54
Seychelles	6	98.02
Sierra Leone	3	88.91
Singapore	580	80.94
Slovakia	161	85.04
Slovenia	66	63.33
Solomon Islands	3	97.10
South Africa	280	74.56

Number of Firms and Key Variables by EMNEs' Host Economy [Cont's]

Country	N	Ownership
South Korea	360	44.88
Spain	115	88.43
Sri Lanka	82	61.22
Sudan	13	64.15
Suriname	4	60.00
Swaziland	24	90.30
Sweden	68	80.91
Switzerland	127	87.77
Syria	18	72.93
Taiwan	42	73.23
Tajikistan	4	48.37
Tanzania, United Republic	24	77.81
Thailand	194	56.51
Togo	1	75.00
Tonga	1	100.00
Trinidad and Tobago	4	95.71
Tunisia	16	51.17
Turkey	268	57.38
Turkmenistan	5	45.48
UAE	224	80.01
Uganda	15	85.01
UK	806	88.45
Ukraine	196	74.03
Uruguay	42	85.44
US	1080	74.68
Uzbekistan	15	76.72
Vanuatu	3	97.33
Venezuela	25	77.24
Vietnam	127	63.95
Yemen	1	10.00
Zambia	32	92.20
Zimbabwe	25	69.68

Notes: N is the number of firms. The host countries include 177 economies. Ownership refers to the subsidiary ownership level controlled by the parent.

Table 2.7: Robustness Checks: Potential Cubic Relationship; Sub-periods; 25.01 per cent as Subsidiary Ownership Threshold; Lag Models

	(1) Cubic model	(2) Sub-period: 2004-2007	(3) Sub-period: 2008-2013	(4) Subsidiary ownership>0.25	(5) One lag model	(6) Two lags model	(7) Three lags model
MULT	11.4887	-8.6289	10.1381**	11.2475***			
	(12.731)	(6.791)	(5.154)	(4.216)			
$MULT^2$	-10.4557	11.5049*	-7.3791	-9.2940**			
	(26.611)	(6.722)	(4.926)	(3.981)			
$MULT^3$	2.0734						
	(16.590)						
MULT (one lag)					0.1000*		
					(0.053)		
$MULT^2$ (one lag)					-0.0712		
					(0.052)		
MULT (two lags)						0.1581**	
						(0.066)	
$MULT^2$ (two lags)						-0.1543**	
						(0.061)	
MULT (three lags)							0.0457
							(0.055)
$MULT^2$ (three lags)							-0.0788*
							(0.047)
Controls	X	X	X	X	X	X	X
Adj R-squared	0.136	0.148	0.098	0.133	0.037	0.041	0.041
No. observation	4227	846	3378	3863	3384	2593	1898
F statistics	11.233	3.838	8.542	10.983	5.417	4.325	4.834

Notes: Return on assets is the dependent variable. All models control for firm and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 2.8: Robustness Checks: Alternative Multinationality Measures

	(1)	(2)	(3)
$OS^{D'ED}$	-0.0768		
	(0.063)		
$OS^{D'ED2}$	0.0015*		
	(0.001)		
$OS^{D'ING}$	0.0206		
	(0.046)		
$OS^{D'ING2}$	-0.0003		
	(0.000)		
$OC^{D'ED}$		0.0764	
		(0.305)	
$OC^{D'ED2}$		-0.0016	
		(0.017)	
$OC^{D'ING}$		0.2344	
		(0.220)	
$OC^{D'ING2}$		-0.0134*	
		(0.007)	
$FSTS^{D'ED}$			4.2495
			(3.784)
$FSTS^{D'ED2}$			-2.4986
			(3.689)
$FSTS^{D'ING}$			-4.6390
			(4.903)
$FSTS^{D'ING2}$			5.9820
			(4.971)
SIZE	2.2639***	2.2449***	4.1939***
	(0.795)	(0.791)	(1.311)
LEV	-6.3623***	-6.3997***	-6.7071***
	(0.691)	(0.684)	(1.146)
PROD	2.3727***	2.3451***	4.5967***
	(0.855)	(0.846)	(1.184)
AGE	-1.6909	-1.3666	-0.2398
	(1.418)	(1.373)	(1.846)
ECON	0.3761	0.4168	1.0698
	(1.227)	(1.211)	(1.414)
GROW	0.2515***	0.2549***	0.1283
	(0.068)	(0.069)	(0.079)
HOMI	-3.2826	-3.1059	-2.6867
	(2.056)	(2.170)	(3.813)
HOSI	0.0958	0.2051	-0.1724
	(0.335)	(0.334)	(0.497)
Adj R-squared	0.136	0.134	0.166
No. observation	4227	4227	1501
F statistics	10.255	11.115	5.824

Notes: Return on assets is the dependent variable. All models control for firm and time fixed effects. OS refers to the number of overseas subsidiaries. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 2.9: Robustness Checks: Alternative Performance Measures; Privately Owned Enterprises' Sectoral Analysis

	(1) All MNEs ROS	(2) All MNEs ROE	(3) All MNEs Net profit	(4) All MNEs Gross profit	(5) POEs High-tech sectors	(6) POEs Low-tech sectors	(7) POEs Manufacturing sectors	(8) POEs Service sectors
$MULT^{D'ED}$	15.2558**	30.2640**	1.4546***	0.5833**	0.3099	0.6552***	0.5639**	0.4931
	(6.239)	(12.764)	(0.511)	(0.228)	(0.341)	(0.234)	(0.236)	(0.343)
$MULT^{D'ED2}$	-14.0463**	-32.0736**	-1.4829***	-0.5370**	-0.1620	-0.6570***	-0.5208**	-0.3689
	(7.135)	(13.889)	(0.521)	(0.240)	(0.434)	(0.236)	(0.247)	(0.399)
$MULT^{D'ING}$	-5.6760	2.0535	-0.2426	-0.0941	-0.2259	-0.0037	-0.2816	0.1166
	(6.903)	(8.337)	(0.475)	(0.208)	(0.331)	(0.308)	(0.246)	(0.496)
$MULT^{D'ING2}$	4.6698	1.4523	0.0993	0.2111	0.3477	-0.0013	0.1561	0.1541
	(8.355)	(10.765)	(0.545)	(0.202)	(0.343)	(0.290)	(0.263)	(0.426)
SIZE	1.0117	5.3273***	0.7957***	0.8745***	0.8414***	0.8559***	0.8634***	0.8727***
	(2.224)	(1.847)	(0.108)	(0.042)	(0.069)	(0.056)	(0.050)	(0.066)
LEV	-8.6172***	-14.7209***	-0.5676***	-0.0559**	-0.0721	-0.0665**	-0.0710**	-0.0367
	(1.137)	(2.253)	(0.062)	(0.024)	(0.046)	(0.028)	(0.028)	(0.043)
PROD	1.5549	5.9880***	0.7592***	0.8897***	0.8650***	0.8850***	0.8834***	0.8953***
	(2.381)	(2.089)	(0.108)	(0.042)	(0.063)	(0.058)	(0.055)	(0.060)
AGE	-2.9856	-0.7021	-0.3495*	0.0124	-0.2346	0.0718	-0.1997	0.0415
	(2.714)	(4.113)	(0.195)	(0.099)	(0.196)	(0.140)	(0.134)	(0.175)
ECON	2.4653	2.0466	0.2538	0.0558	0.2051**	0.1615**	0.1306*	0.3598***
	(2.205)	(3.383)	(0.160)	(0.066)	(0.085)	(0.081)	(0.072)	(0.124)
GROW	0.3135***	0.5494***	0.0353***	-0.0004	0.0050	-0.0035	0.0011	-0.0067
	(0.097)	(0.152)	(0.008)	(0.003)	(0.006)	(0.005)	(0.003)	(0.007)
HOMI	4.9487	-7.1859	0.4985*	0.0765	-0.1022	0.0219	0.1556	-0.2653
	(3.134)	(7.282)	(0.258)	(0.104)	(0.204)	(0.139)	(0.150)	(0.186)
HOSI	-1.0610	0.4676	-0.0632	0.0006	0.0114	-0.0092	-0.0240	0.0303
	(0.844)	(0.947)	(0.050)	(0.023)	(0.048)	(0.032)	(0.025)	(0.052)
Adj R-squared	0.081	0.095	0.219	0.624	0.694	0.559	0.641	0.589
No. observation	4115	4227	2946	3517	892	2185	1730	1223
F statistics	7.682	7.419	18.448	71.020	44.984	41.338	49.927	33.369

Notes: Return on assets is the dependent variable. All models control for firm and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 2.10: Summary of 67 Empirical Studies (Multinationality-Performance Literature)

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
1	Severn and Laurence (1974)	62 US MNEs from Fortune 500 and 70 US domestic firms in manufacturing industries	ROA (Before and after tax)/economic profitability	Dummy variable/FATA	R&D intensity	No significant relationship, but intervened by R&D intensity
2	Hughes et al. (1975)	46 US MNEs and 50 US non-MNEs (19701973)	Risk adjusted returns	FSTS	Not specified	Positive
3	Siddharthan and Lall (1982)	74 US manufacturing firms (1976-79)	Firm growth (growth of consolidated sales revenue)	FSTS	Firm size (sales); advertising intensity; R&D intensity; ROE (net income on equity);	Negative
4	Kim and Lyn (1986)	154 US firms (1974-1978)	Excess market value	FSTS, OS	Intensity of advertising expenditures, intensity of research and development expenditure, expected growth rate as measured by past growth, proxy for monopoly power	Positive relationship using FSTS, insignificant relationship using OS.
5	Michel and Shaked (1986)	58 US MNEs and 43 non-MNEs (19731982)	Risk-adjusted Returns (i.e. Sharpe, Jensen and Treynor measures)	FSTS (20% as threshold)	Not specified	Negative
6	Shaked (1986)	58 US MNEs and 43 non-MNEs (19801982)	ROA/insolvency probability	FSTS (20% as threshold)	Not specified	No difference in terms of average ROA; insolvency probability lower for MNEs
7	Buehner (1987)	40 largest West German firms	Risk-adjusted returns, ROS, ROA	Sales-based Herfindahl index (D=1-sum(p2)). p is FSTS to each market region.	Firm size (sales); growth (growth sales); leverage (debt to equity ratio); ownership (a party owned $>$ 25 percent of the equity); M-form structure (chart information); product diversification	Positive in general
8	Grant (1987)	304 large British manufacturing firms (197284)	Sales growth, ROS, ROA, ROE, profit growth	FSTS	Firm size (sales) and industrial effects	Positive in general; in addition, suggestive evidence that overseas production increased profitability
9	Grant et al. (1988)	304 large British manufacturing firms (197284)	ROA	FSTS	Industrial effects; firm size (sales); leverage	Profitability encourages overseas expansion, which in turn generates increased profit

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
10	Daniels and Bracker (1989)	116 US firms in Forbes 1984 (197483)	ROS, ROA	FSTS, FATA	Industrial effects	Inverted J curve
11	Geringer et al. (1989)	100 largest MNEs from US and Europe respectively (19771981)	ROS (after-tax), ROA (standardized)	FSTS	Not specified	Inverted J curve (threshold of Internationalization')
12	Kim et al. (1989)	62 US MNEs (19821985)	Growth of ROA and ROS, instability of ROA and ROS	Sales based entropy index capturing product and market diversification	Not specified	Indeterminate; contingent upon the relatedness of business diversification
13	Collins (1990)	133 US firms from Fortune 500 (19761985)	Average rate of return, Jensen measure	FSTS	Not specified	Insignificant between MNEs with presence in developed countries and domestic firms; negative if MNEs with main presence in less developed nations
14	Soenen (1990)	46 manufacturing MNEs (1978-1986)	BETA (systematic risk), P/E (price/earning) ratio	FATA, FSTS, FPTP	Not specified	Insignificant MP relationship; significant positive relationship when FATA is smaller than 25%.
15	Morck and Yeung (1991)	1644 US firms (197680)	Tobin's Q	No. of subsidiaries, No. of nations hosting subsidiaries	Market value per of tangibles, R&D spending per of tangibles, Advertising of tangibles Leverage; firm size; labor growth	M has no direct or marginal negative impact but enhances the impact of R&D and advertising on Tobin's q
16	Kim et al. (1993)	125 largest US MNEs in 1982 Forbes survey	Risk-adjusted ROA	Foreign countries	Industrial effect	Positive
17	Sullivan (1994)	74 most international US manufacturing firms in 1990	ROS, ROA	DOI = FSTS+FATA +OSTS+PDIO+TMIE	Not specified	Horizontal S
18	Al-Obaidan and Scully (1995)	44 largest petroleum enterprises (19761982)	Scale efficiency, technical efficiency	Dummy variable	Government ownership; extent of vertical integration	MNEs are about 3% higher in scale efficiency but 10% lower in technical efficiency compared with non-MNEs
19	Sambharya (1995)	53 largest US firms (1985)	ROS, ROA, ROE	FSTS, FATA, OS	Size, GMD	Insignificant MP relationship

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
20	Allen and Pantzalis (1996)	363 US firms in 1991	Value of operating flexibility variable (based on excessive value)	BREADTH (OC). DEPTH (ratio based on number of foreign subsidiaries); NSO (OS); NFS (Dummy variable: equal to 1 if the MNE owns a financial subsidiary.)	Excess valuation (EVS) = (Market Value of Equity + Book Value of Debt - Total Assets)/Sales.Advertising intensity (advertising expenditures / sales for 1991). R&D intensity (R&D expenditures / sales for 1991). Growth of sales is the geometric average of sales revenues for the five years 1987-1991. LTD is the Long-term Debt to Total Assets ratio.	Positive relationship.
21	Tallman and Li (1996)	192 US. manufacturing MNEs in 1987	ROS	FSTS, OC	Firm size (sales), Firm leverage; industry growth	Marginal positive relationship
22	Hitt et al. (1997)	295 US. manufacturing firms (19881990)	ROA, R&D intensity	Sales-based entropy index	Firm size (sales), Product diversification; capital structure (debt to sales ratio)	Inverted U shaped curve; Positive relationship between M and R&D intensity
23	Qian (1997)	169 largest US industrial firms from 1981 to 1990	ROA, ROE	Entropy measure based on number of subsidiaries.	T-test: Control variables: Not specified	Positive relationship
24	Mishra and Gobeli (1998)	105 manufacturing MNEs (1986-1988)	q-Value: market value of the firm/book value of assets.	Dummies based on critical value of OS, FSTS.	Leverage is one plus debt-to-equity ratio. Size (sales). Foreign Sales/net sales). R&D Spending/net sales. Managerial Incentives Alignment is a standardized measure of long-term pay-performance sensitivity, Industry dummies.	Not significant. But the interaction product of R&D with multinationality is significant.

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
25	Katrishen and Scordis (1998)	93 insurance companies from 15 countries (19851992)	Operating expenses	Index based on OC weighted by degree of commitment.	Financial assets; diversity; reinsurance usage; line of business (the amount of property and casualty business an insurer sells as a percentage of its total business.), ownership structure (takes the value of 1 if the insurance firm is a stock firm and 0 if it is a mutual firm)	The ratio of operating expense to total income accelerates with the international diversity
26	Qian (1998)	164 US industrial firms (198192)	ROE	FSTS	Firms size (sales); industrial effects; lagged ROE (average of ROE for the first six years 1981-1986)	Positive with FSTS above 15%; indeterminate with FSTS below 15%
27	Bodnar et al. (1999)	4722 firms (1987-1993)	VM (A adjusted value measure derived from EV, MTB and P/E). EV (market value of common equity book value of common equity)/sales); MTB (market value of assets/book value of assets.); P/E (price earning per share)	MNE dummy.	Size (sales), leverage (debt to market value of total assets), EBIT/sales, Capex/Sales (capital expenditures to sales), R&D/Sales, Adv/Sales, Industry diversification dummy (equal to 1 if industrially diversified)	Significant positive relationship
28	Delios and Beamish (1999)	399 Japanese manufacturing firms (19911995)	Composite performance construct using ROA, ROS, and ROE	OS and OC	Product diversity; R&D, and advertising intensity, financial leverage, industrial profitability, industrial growth rate and concentration	Positive

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
29	Doukas et al. (1999)	362 US firms in 1991	EVS (Market Value-Book Value)/Sales)	OS and OC. CON2 = Concentration ratio of foreign subsidiaries in the two top foreign countries.	Long Term Debt/Total Assets. GS = Geometric 5-year growth rate of Sales. CF = Cash Flow. RISK = log (Highest Price for the stock in 1991)/(Lowest Price for the stock in 1991). R&D Expenditure / Sales. Advertising Expenditures / Sales.	Positive relationship in RD-intensive firms and AD-intensive firms.
30	Gomes and Ramaswamy (1999)	95 US. manufacturing firms (19901995) in the industries of chemicals, drugs, computers etc.	ROA, OPSAL (Operating costs to sales)	A composite index generated by principal component analysis of FSTS, FATA and country scope	Firm size (sales) and industrial effects	Inverted U-shaped curve between multinationality and ROA; U shaped curve between multinationality and OPSAL
31	Geringer et al. (2000)	108 Japanese manufacturing firms (19771993)	ROS, sales growth	FSTS	Firm size (number of employees); leverage (long term debt to assets ratio); industrial effects	Negative (positive) with ROS (sales growth) as dependent variable. However, the relationship only holds for 19771991 rather than the entire period
32	Zahra et al. (2000)	321 US new ventures (mail survey)	ROE, sales growth.	Multiple measures (e.g. OC, technological diversity, cultural diversity, geographic diversity, foreign market segment, etc.)	Firm age; firm size (employees); venture ownership; international experience (substracted the year a firm was established from the year its products were first sold overseas); mode of entry; lagged ROE (sales growth)	Positive in general
33	Lu and Beamish (2001)	164 small and medium sized Japanese firms (19861997)	ROA	OS, OC	R&D intensity; Advertising intensity; firm size (employees); product diversity; exchange rate; Export intensity; joint venture; industry dummies.	U shaped curve; exporting moderates the relationship negatively

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
34	Pantzalis (2001)	420 US MNEs in 1990	Tobin's Q and excess Q		Firm size (book value of total assets); leverage; R&D and advertising intensity; risk; ownership (insider, blockholder, institution); corporate business focus; industry effects	Market value of MNEs with operations in developing countries is significantly higher than that of MNEs without operations in developing countries
35	Ramrez-Aleson and Espitia-Escuer (2001)	103 Spanish nonfinancial firms (mostly manufacturing) (19911995)	Ratio of net operating profit to net operating assets (ROOA), Tobin's Q	Categorical measure (the average number of countries in which the firm is present); entropy index based on the OS in six geographical area	Firm size (sales); industry effects	Insignificant with ROA but positive with Tobin's Q as dependent variable
36	Christophe and Pfeiffer (2002)	1197 MNCs and 5921 DMCs (1990-1994)	Tobin's Q	Fi is measured as foreign sales in region i scaled by the replacement cost of the firm's assets. D is measured as domestic sales scaled by the replacement cost of the firm's assets.	RD is research and development expenditures normalized by assets, AD is advertising expenditures normalized by assets, DEBT is long-term debt normalized by assets, ASSET is the natural log of the firm's assets, industry dummies and year dummies.	Not significant
37	Dastidar (2002)	8964 US, UK, Japan firms with 40004 firm years (1990-1998)	Excess value	Global dummy (equal to one if only globally diversified)	OLS firm fixed effects, Heckman two steps: Control variables: Relative Leverage, Relative Size, Relative Profit Margin	Not significant
38	Denis et al. (2002)	7520 US firms with 34200 observations from 1984 to 1997	Excess value: total market value/ the sum of the imputed market values of its segments.	Global dummy (equal to one if only globally diversified), Multi-segment dummy (equal to one if only industrial diversified)	OLS: Control variables (measured as deviations from industry median of domestic single-business firms): Market value of total capital. Long-term debt to total capital. Capital expenditures to sales. EBIT to sales. R&D to sales. Advertising to sales.	Negative relationship

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
39	Kotabe et al. (2002)	49 US manufacturing firms (19881993)	ROA, OPSALINV (ratio of sales to operating costs)	Foreign income/ total income	R&D intensity; advertising intensity; firm size (sales); industrial effects	R&D intensity and advertising intensity jointly moderate the MP relationship positively
40	Qian (2002)	71 US small and medium-sized manufacturing firms (19891993)	ROS	FSTS	Firm size (1993 sales); firm age; R&D, and advertising intensity; product diversification; financial leverage	Positive; Moderate product diversification moderates MP relationship positively
41	Capar and Kotabe (2003)	81 major German service firms (19971999)	ROS	FSTS	Firm size (number of employees); industrial effect	U curve
42	Contractor et al. (2003)	103 largest service companies (19831988)	ROS, ROA	3-component index (FSTS, FETE, OSTS)	Firm size (number of employees); Industrial sector effect, and home country effect	Horizontal S-shaped curve (esp. the knowledge-intensive subsample)
43	Goerzen and Beamish (2003)	580 Japanese MNEs in 1999 Structural equation modeling	Jensen's Alpha; Sharpe's measure; Market to book ratio	Employees-based entropy index; Entropy indices based on political, economic, and cultural index	Product diversity; proprietary assets; industry profitability; firm size (employees); capital structure; international experience (log of average subsidiary age)	Positive between International asset dispersion and performance; negative between country environment diversity and performance
44	Ruigrok and Wagner (2003)	84 largest German manufacturing firms (19931997)	Pretax ROA, OCTS (operating costs to total sales)	FSTS	Firm size (employees and assets); industrial effect	U curve for ROA; inverted U curve for OCTS. (Both are only significant at quadratic term, insignificant at linear term)
45	Christophe and Lee (2004)	100 largest US MNEs (1999)	Tobin's Q	DOI composite (sum of five variables), FATA, FSTS, OSTS, TMIE, PDIO	Advertising expenditures to assets ratio, R&D expenditures to assets ratio, size (assets), debt to assets ratio.	Negative relationship between internationalisation and firm value. U-shaped relationship
46	Li and Qian (2005)	167 largest US firms on Fortune 500 list (19931997)	ROS and ROA	3-component index (FSTS, FATA, FETE); Regional Diversification: sales-based entropy	Firm size (sales); R&D intensity; Financial leverage (long-term debt to total capital); country GNP growth; GNP per capita	Reflecting an inverted U curve

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	Sampling and Data Sources	Measures of Performance	Measure of International Diversification	Explanatory Variables	Findings
47	Thomas and Eden (2004)	151 US manufacturing firms (1990-1994)	ROA, ROE, Excess market value, Avg.market value	Multinationality index using a principal componets analysis of the FSTS, FATA, OS and OC	R&D expenditures to sales ratio, Administrative costs to sales ratio, size (assets), debt to equity ratio, industry control	Positive relationship. U-shaped relationship, weak evidence of S-curve using Spline analysis
48	Lu and Beamish (2004)	1489 Japanese firms (19861997)	ROA; Tobin's Q	Composite index based on OS and OC	R&D and advertising intensity; size (net sales is sales in Orbis); exchange rate; product diversity; export intensity; debt-to-equity ratio	Horizontal S-shaped; R&D intensity and advertising intensity moderates the multinationalitype-rformance relationship positively
49	Annavarjula et al. (2006)	197 relatively large US manufacturing firms	ROE	Multi-item index (MULTI = FSTS + OSTS +PDIO)	R&D, and advertising intensity; capital intensity; monopoly power (market to book value ratio: equivalent to Tobin's Q); product diversity	Positive; Market to book value positively moderates MP relationship
50	Andersen (2005)	1542 US firms (1996-2000)	ROA	OS and OC	Firm size	Positive relationship
51	Li (2005)	574 American service firm (19972001)	gross ROS and net ROS	FSTS	Size (sales); business diversity; capital expenditure intensity; market share; debt to assets ratio; superior growth and downsize (1 if the annual reduction rate of total assets is above 20%; 0 otherwise); industry control	Horizontal S-curve for the whole sample; Home region oriented strategy positively moderates multinationalitypерformance relationship
52	Hitt et al. (2006)	72 US law firms (1992-1999)	ROS	Entropy measure based on OC and the number of lawyers in each office.	Firm size (number of employees), leverage (number of associates to number of partners ratio), domestic geographic dispersion, service diversification, past performanc, location in New York City	Positive relationship

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
53	Castellani and Zanfei (2007)	1147 firms with 2937 observations (1994-1996)	Value added, TFP	Dummies: DOM (Firms serving only the domestic markets), MNF1 (MNEs controlling only non- manufacturing plants abroad), MNF2 (MNEs controlling at least one manufacturing plant abroad).	Number of R&D personel, patent application (dummy)	Positive relationship
54	Contractor et al., (2007)	269 Indian firms (1997-2001)	ROA, ROE, ROS	FSTS	Pooled cross-sectional time series regression with autoregressive-heteroskedastic model: Size (sales), age, industry fixed effects	Positive relationship. U shaped relationship
55	Ruigrok et al. (2007)	87 Swiss MNEs in manufacturing sectors (1998-2005)	Pre-tax ROA	FSTS	Firm size (number of employees), industry dummies	Negative relationship. Inverted S-shaped relationship
56	Andersen (2008)	1175 US firms (1996-2000)	Pre-tax ROA; ROI	OC	Firm size (assets), Financial leverage (debt to retained earnings ratio), R&D intensity, market-to-book value	Positive relationships in manufacturing and knowledge-based service industries; negative relationships in capital-based service industries.
57	Pangarkar (2008)	74 Singapore SMEs	Composite index based on ROS, growth in sales, foreign profits, growth in profits, ROA, experience and knowledge gained from foreign operations	Composite index based on foreign sales in regions with different weightings.	Firm size (sales); host country attractiveness, capabilities	Positive relationship
58	Qian et al. (2008)	189 largest US firms (1996-2000)	ROA, ROS	Entropy measure based on OC in 10 global regions.	Firm size (employees), firm age, R&D intensity, leverage (debt to assets ratio), firm risk (std. dev. of firm profitability (both ROA and ROS)), product scope (entropy), industry effect.	Positive relationship, Inverted U-shaped relationship
59	Gaur and Kumar (2009)	240 firms in India (1997-2001)	ROS	Logit transformation of FSTS	Sales, age, industry dummies	Positive relationship. Increasingly positive relationship

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of International Diversification**	**Explanatory Variables**	**Findings**
60	Chao and Kumar (2010)	Fortune Magazine's Global 500 firms from 31 countries (2002-2004, but take the average when running regression)	ROA	Average of OS/maximum OS in the sample and OC/maximum OC in the sample.	International experience (number of years a company had international operations), firm size (employees), leverage (debt to equity ratio), home country economic openness	Positive relationship, inverted-U shaped
61	Lin, Liu and Cheng (2011)	179 firms in Taiwan (2000-2005)	ROA	Sum of FSTS, FATA, OC (overseas countries)	Firm age, firm size, insider shareholding, diversification, R&D intensity	Negative relationship
62	Oh and Contractor (2012)	315 firms in US (1998-2004)	Market value (the sum of the common equity, preferred stock, and debt.)	FSTS	R&D expenditures /assets), Advertising expenditures /assets, advertising intensity, firm size, industry, year	Not significant for the total sample, Significant positive in proximate region subgroup, Significant negative in distant region subgroup, Not significant in global expansion MNEs subsample.
63	Banalieva (2013)	625 firms with 3061 observations in 12 Triad countries from 1997 to 2006. OSIRIS (similar version to Orbis), Bloomberg Terminal	ROA, Tobin's Q	Home-region orientation (HRO): (regional sales (excluding domestic sales)/ foreign sales)	2SLS, 3SLS. Control variables: Marketing advantage, ID (FSTS), Product diversification (Herfindahl), Regional market Attractiveness, Age, Institutional distance, Size (sales), Industry HRO, Firm fixed effects, Year fixed effects	Not significant relationship regional diversification has on firm performance
64	Yang et al. (2013)	16,000 firms from 46 countries (1997-2007)	ROS	OSTS	assets, employees, firm age, foreign ownership, country effect, industry effect	Positive relationship, U-shaped

Summary of 67 Empirical Studies (Multinationality-Performance Literature) [Cont's]

	Empirical Studies	Sampling and Data Sources	Measures of Performance	Measure of International Diversification	Explanatory Variables	Findings
65	Kim, Hoskisson and Lee (2014)	183 Korean manufacturing MNEs (1993-2003)	Principal component of ROA, ROS, and ROIC.	OC	Intangible resource (sum of R&D intensity and advertising intensity), firm leverage (total liabilities over total sales), product diversification, business group affiliation, sales growth (the percentage change in annual total sales), export intensity, government ownership, firm profitability (focal year's average of ROA, ROS, and ROIC), industry effects.	Positive relationship (MNEs into Resource-Poorer host countries); U-shaped relationship (MNEs into Resource-Richer host countries)
66	Noni and Apa (2015)	311exporting firms in Italy (2007)	Composite index Z-score based on added value per employee, profit margin on turnover, ROS and financial expenses.	FSTS	Firm size (employees), firm age, province, industry.	Positive relationship
67	Berry (2016)	U.S. MNEs (1989-2007)	ROA	Average of OSTS and OCTC, the denominator is the maximum number of subsidiaries (countries) in a given year for any firm in the sample		Marginally significant U-shaped for manufacturing firms

Notes: GMD refers to Global Market Diversification. FSTS refers to the ratio of foreign sales to total sales. OS refers to number of foreign subsidiaries. OC refers to number of foreign countries. OSTS: the ratio of the number of overseas subsidiaries to total number of subsidiaries. OCTC: the ratio of the number of overseas countries to maximum number of countries (in the sample). OCTS refers to operating cost to sales.

Table 2.11: Key Issues in International Diversification Strategy Literature

Issue	**Main alternatives**	**Recommendations**
Unit of analysis	Firm-level, Industry-level	Firm-level
Motivations of diversification	access cheaper resources, foreign knowledge, economies of scale, obtain internationalisation experience, exploit firm-specific assets in foreign markets, reduce the fluctuations of revenue	Incorporate important motives in empirical model
Measures of performance	Accounting performance (ROA, ROE, ROS, EBITOA), Market performance (Tobin's Q, excess value)	ROA
Measures of firm diversification	FSTS, FATA, OSTS, OCTC, OS, OC, GMD, Herfindahl based on sales, Entropy based on sales, Global dummy	OSTS = the ratio of number of overseas subsidiaries to total number of subsidiaries
Estimation Method	OLS, OLS FE/RE, IV/2SLS, 3SLS, PLS, GLS, ANOVA, T-test, Orthogonal comparisons, Hierarchical regressions	Depends on data availability, OLS
Functional form	Linear, Curvilinear	Curvilinear
Time lags	Concurrent measures of diversification and performance	Discuss the possible lags
Control variables	Firm-level: Size, Leverage, R&D intensity, Advertising intensity, Age, Firm fixed effect, Industry-level: Industry profitability, Industry growth, Industry fixed effect, Country-level: Country fixed effect, GDP growth, Dyadic-level: Institutional distance, Year-level: Year fixed effect	Size, Leverage, Sales per worker, GDP growth, GDP per capita
Moderating variables	Prior PD experience, Prior ID experience, PD (related/unrelated), exporting, High-tech vs. low-tech sectors, US vs. Europe	High-tech vs. low-tech sectors, Emerging home countries vs. developed home countries,

Chapter 3

Does Product Diversification Matter to Firm Performance?

3.1 Introduction

The product diversification-performance relationship has been a vital research topic for strategy scholars over the past four decades (Palich et al., 2000; Majocchi and Strange, 2012; Kuppuswamy and Villalonga, 2015; Ramaswamy et al., 2017). Multi-business firms expand production across different sectors outside of their home sectors, bringing some benefits and costs. On the one hand, product diversification leads to benefits such as synergies, internal market efficiency, market power advantage, and portfolio effects. On the other hand, product expansion results in various costs. These might be associated with bureaucratic costs, increased information asymmetries and cross-subsidising inefficiencies. In sum, the observed relationship between product diversification and performance is the net effect of the above benefits and costs (Benito-Osorio et al., 2012).

This paper attempts to link the product relatedness to the debate on the diversification-performance (PD-P) relationship. Prior studies are inclined to focus on whether the relationship is linear or propose various functional forms by adding higher-order terms. However, they generally disregard how important moderators, such as product relatedness, shape the PD-P relationship. Moreover, the knowledge on relatedness are limited at the mere distinction between relatedness and unrelatedness, and insufficient attention has been given to the finer classification of relatedness.

Product relatedness is one important aspect in measuring product diversification, while relatedness is a rather broad concept. However, the large literature gives limited attention to the performance implications of fine-grained measure of product diversification (Yang and Singh, 2014; Dhir and Dhir, 2015). It largely disregards the heterogeneity among products in different stages of value chain and instead choose an aggregate view of related diversification investment. Within a few exceptions (Fan and Lang, 2000; Hendricks et al., 2009), they did not consider the curvilinear PD-P relationship when considering finer classification of product relatedness (e.g., vertical relatedness). Crucially our data have the information regarding the product location

in the value chain. We attempt to look into whether the returns to diversification for firms investing in vertical related products are different from those investing in horizontal related products.

We further explore the finer classification of vertical relatedness, particularly considering the upstream and downstream relatedness. The extant PD-P literature is generally silent on the finer classification of vertical relatedness (i.e., upstream and downstream relatedness), particularly from a value chain perspective. By further unpacking the vertical relatedness, the vertical diversification could be categorised into upstream and downstream diversification. The upstream and downstream subsidiaries play different roles and create different synergies across the firm's product portfolio. The distinction between upstream and downstream diversification allow us to analyse a whole aspect of vertical diversification, contributing to the diversification literature (Heras et al., 2010; Sun and Ni, 2012). To illustrate this finer classification, we draw Figure 3.1 to show how to classify three sets of diversification types based on their product relatedness with core business, particularly considering relatedness versus unrelatedness, horizontal versus vertical relatedness, and upstream versus downstream relatedness. To test our hypotheses, we draw on data containing 12,357 firms from a large country coverage of 63 economies during 2004 to 2013.

As in prior studies, we find a U-shaped relationship between related diversification and performance, which seems to be similar to findings in some studies (Khanna and Palepu, 2000; Yang and Singh, 2014), but additional factors matter. First, although a significant positive effect of related diversification on performance at later stage is proved, we find that this positive effect is large when investing in vertical related than in horizontal related products. Moreover, we find that the positive effect of investing in vertical related product at later stage is strengthened in upstream than in downstream diversification. These results suggest that multi-product firms' performance benefit a lot from the synergies derived from the resource complementarity rather than resource similarity, which seems to explain

why firms are inclined to invest more in vertical related products than in horizontal related products. Also, these results seem to explain firm's upgrading strategies (Schiller, 2011), and why upstream diversification perform better than downstream diversification when generating different synergies.

The rest of this paper is structured as follows. Section 2 reviews the pertinent literature and develops our hypothesis. We explain our data collection and empirical models in Section 3. Section 4 reports empirical results. Section 5 contains our conclusions.

3.2 Literature Review and Hypotheses Development

Product diversification generates various benefits for firms. Scholars usually employ synergies, market power advantage, internal market efficiency, portfolio effects and taxation advantage to explain the positive role of diversification. First, the strategy literature maintains the synergies (or economies of scope). The shared use of valuable common input, including physical capital (e.g., machines) and human capital (e.g., know-how), makes multi-business firms more attractive than single business firms (Rumelt, 1982; Teece, 1982). Second, diversification creates an internal capital market that is cheaper when effectively managed, particularly if there is imperfection in the external market (McCutcheon, 1992; Schmid and Walter, 2009). Third, through predatory pricing, diversified firms have market power advantage over more focused competitors when barriers to entry exist (Caves, 1981; Saloner, 1987). Fourth, the portfolio effects highlight the benefits of reduced fluctuation of revenue streams that are not perfectly correlated across different business lines. This coinsurance effect tends to reduce the risk of bankruptcy, and improve debt rating and debt capacity (Lewellen, 1971; Singh and Montgomery, 1987; Berger and Ofek, 1995; Schmid and Walter, 2009). Further, the utilisation of the unused debt capacity in the acquired firm adds to the total debt capacity of the conglomerates.

The increased interest tax shield creates value, since highly leveraged diversifiers are expected to have lower tax payments (Berger and Ofek, 1995; Servaes, 1996; Schmid and Walter, 2009). Finally, the diversified firm can also benefit from the exploitation of parenting advantage, which means that the parent adds more value to its business units than other rival patent (Goold et al., 1998).

While several factors contribute to the prediction of the positive performance effect of product diversification, a number of factors may have negative impact on firm performance. Previous research suggests that product diversification might be associated with information asymmetry, bureaucratic cost, cross-subsidisation inefficiency and principal-agent problems. First, the larger coordination and motivation costs arise from the information asymmetry between top management and divisional managers. The divisional managers may not want to reveal information about the productivity of resources within the division for personal reasons (e.g., less effort, more compensation) (Harris et al., 1982). Second, diversification adds costs and constraints on the business units. Inefficiency arises when business units have to comply with headquarters' guidelines and miss opportunities to motivate employees by offering equity ownership or options (Porter et al., 1996). Third, to reduce the chance of divestiture and layoffs, the members in the troubled business unit might try to lobby top management to allocate resources to them, using distorted and concealing information. This inefficiency in resource allocation discourages well performing units from creating more profit (Meyer et al., 1992). Fourth, managers chose to engage their firms in conglomerate diversification since they cannot effectively diversify this risk with a personal portfolio, which conflicts with shareholders' interests and creates high agency cost. (Amihud and Lev, 1981). Further, dividend payouts benefit shareholders but reduce the amount of resources under managers' control, thus decreasing managers' power. Therefore, managers tend to use the free cash flow in diversification activities, particularly low-return projects when they cannot find good investment opportunities (Jensen, 1986).

There is a considerable literature on the relationship between product diversifi-

cation and performance (Palich et al., 2000), but much of it uses data multi-business firms from one country. The empirical findings are rather mixed (see a summary of prior 61 studies' results in Appendix A, Table 3.11-3.12). Some empirical papers find evidence that supports that product diversification can enhance performance (Rumelt, 1982; Chang and Hong, 2000; Qian, 2002; Miller, 2006). However, some other papers, mainly from financial scholars, find negative PD-P relationship (Lang and Stulz, 1994; Best et al., 2004; Hoechle et al., 2012; O'Brien et al., 2014). The meta-analysis by (Palich et al., 2000) highlights the importance of curvilinear PD-P relationship. Recently, scholars pay more attention to curvilinear relationship. Some empirical studies discover inverted U-shaped relationship (Nachum, 2004; Li and Yue, 2008; Singh et al., 2010; Kistruck et al., 2013; Benito-Osorio et al., 2015; Brahm et al., 2017), while others find U-shaped relationship (Zahavi and Lavie, 2013; Yang and Singh, 2014; de Andrés et al., 2017). Alternatively, some scholars hypothesise S-shaped relationship (Hashai, 2015).

These seemingly contrasting empirical results of the PD-P relationship may in part due to the ignorance of important variables such as product relatedness. Additionally, most of the extant literature focus on the discussion of the first three models (positive linear, negative linear, and inverted U-shaped models), A survey paper by (Benito-Osorio et al., 2012) called for more research on the relative newer model (e.g., U-shaped model and intermediate model) explaining PD-P relationship. Very few papers provide explanation of the relative newer model (U-shaped model), with only a few exemptions (Zahavi and Lavie, 2013; Yang and Singh, 2014; de Andrés et al., 2017) that provide some evidence on U-shaped model. But we need more research on this relative newer model. Further, these arguments and empirical results are mainly based on analysing multi-product firms from one country, except few papers (Li and Yue, 2008; Galván et al., 2014). This limits the generalisability of their findings and applying to other countries.

Value chain related diversification activities are becoming increasingly common among MNEs and the key driving force for global value chain (GVC) disintegra-

tion. For instance, MNEs from energy sector invested in upstream, horizontal and downstream industries in Mexico. Conglomerate Sameer Group (Kenya) invested in various industries such as agriculture, high-tech, manufacturing and distribution. Conglomerate DuPont and IBM (America) invested in upstream industries (research and development) in Africa through the purchase of seed company Pannar's majority share and the establishment of a research laboratory, respectively (UNCTAD, 2014, 2016). The emerging conglomerate giants from developed and emerging economies have attracted academics and managers' attention. It is interesting and fascinating for scholars to understand why and how MNEs diversified into new industries and subsequently perform (our research model is shown in Figure 3.2).

3.2.1 Relatedness, Unrelatedness, Diversification and Firm Performance

Product relatedness is at the centre of the debate in the product diversification literature. The research focus is whether firms that adopt related diversification can outperform those pursuing unrelated diversification (Christensen and Montgomery, 1981; Rumelt, 1982; Grant et al., 1988). The rationale for the superiority of related diversification is economies of scale and scope (i.e., synergies) (Teece, 1980).

Firms that adopt related diversification realise the synergies such as economies of scope (Teece, 1980). Since the related businesses are similar to the core business, the firm can transfer the core factors that contribute to the core business' efficiency to its related businesses (Rumelt, 1982). The synergies can be exploited through joint use of tangible and intangible assets. The former refers to the sharing activities such as joint production process and distribution channels. The latter refers to transferring skills. Know-how learned in one division is applied to another (Porter, 1985). For instance, several related business units of Texas Instrument share R&D products in order to achieve operating efficiency (Palich et al., 2000). Overall, the firm benefits from economies of scope when the costs of producing two or more products jointly are smaller than the costs of producing them separately (Panzar and Willig, 1981).

Also, the relatedness of diversification helps firms achieve economies of scales, since the firm can use the assets already capitalised in other activities in the related businesses: the costs of assets are spread over a number of businesses (Markides and Ittner, 1994).

While related diversification is associated with economies of scope, unrelated businesses mainly rely on general skills (e.g., financing, management) that are not necessarily linked to the critical success factor in a given market. The low market power of unrelated businesses in the respective markets can be anticipated. Also, since unrelated businesses have less possibility of being able to benefit from the transferability of core skills derived from the core business, the synergies are mitigated or absent (Montgomery and Singh, 1984). Also, (Lubatkin and Chatterjee, 1994)'s study shows that, with respect to the ability to reduce risk, related businesses outperform very dissimilar businesses. In addition, the unrelated diversifiers suffer from the extensive costs of managing complex operations (Jones and Hill, 1988; Markides, 1992). The unrelated businesses might have a conflicting management style and culture, adding to the difficulties in the effective operation of a conglomerate (Galván et al., 2014). A number of studies find empirical evidence that supports the superiority of a related strategy over unrelated one (Markides and Williamson, 1996; Mayer and Whittington, 2003; Tanriverdi and Venkatraman, 2005; Colpan, 2008). A meta-analysis by (Bausch and Pils, 2009) finds that related diversification is more effective than unrelated diversification in improving firm performance.

We draw on Haans et al. (2016) to provide an explanation of the interplay of costs and benefits that shape the effect of related product diversification on firm performance, by considering the two latent mechanisms that determine related product diversification-performance (RPD-P) relationship.

On the one hand, the positive effects are derived from multi-sector operation in related sectors. Related diversifiers can benefit from economies of scope derived from relatedness among different products. At low level of related diversification, the economies of scope are restricted, since there is limited opportunities of leverage

tangible and intangible resources across related product categories. However, as the level of related diversification increases, these is enhanced opportunities for resources sharing and redeploying. Also, the accumulated practices and knowledge from prior experience help the firm more effectively leverage product relatedness across related product lines. As a result, the benefits of related diversification grow at an increasing rate.

On the other hand, the negative effects are arising from multi-business operation in related businesses. The ability of effectively transferring resources and knowledge across products needs to be learned. The misallocation and misapplication of resources and practice will happen when there is a negative transfer. At low level of related diversification, where there are subtle differences across related products, the effect of negative transfer is expected to be obvious. The managers tend to ignore these subtle differences and simply copy the existing practice and knowledge that work well for core product. They fail to develop unique capabilities to support the development of new products and fail to make necessary adaptation when applying the core resources and competence in the new products. This leads to operational issues in the new product division. The firm may face great organisational costs when carry out related diversification at low level. However, the distinct feature of related product will become more observable as the level of related diversification increases. At high level of related diversification, the differences among related product will become obvious, and the managers can be more be aware of these differences. Technology and managerial practice are redeployed in new product with some needed adjustment. Thus, the firm encounter less liabilities of negative transfer at high level of related diversification. Moreover, the knowledge gained from earlier investment in related products reduce the costs and inefficiency associated with negative transfer. The firm have better knowledge of how to transfer and apply the resources (e.g., capital, marketing) across related product categories. Further, the initial sunk costs of creating multi-product division structure is high, including information asymmetry, cross-subsidisation inefficiency and principal-agent problems. Therefore, the

negative effect of related diversification increases at a decreasing rate.

Taking together these two opposing effects of operation in related products on firm performance, we subtract the accelerated increasing function from the decelerated increasing function, whose net effect is a U-shaped relationship between related diversification and performance. At low level of related diversification, the negative effect of related diversification prevails, leading to a negative impact of related diversification on firm performance. At high level of related diversification, the positive effect dominates, leading to the positive impact of related diversification on firm performance.

Overall, relatedness within a product portfolio is the key difference between related and unrelated diversification. On the one hand, the product relatedness of related diversification contributes to the transferability of core skills between related businesses and the sharing of common resources. The firm can enjoy the positive effects of economies of scope after learning how to effectively transfer the resources and competence across different product categories. On the other hand, unrelated businesses are unlikely to benefit from economies of scope. Also, unrelated businesses' conflicting management style and complex operations incur huge management costs. Accordingly, we propose the following hypotheses.

Hypothesis 1a: Related product diversification has a U-shaped relationship with firm's financial performance, such as it has (a) a negative linear effect and (b) a positive quadratic effect on performance.

Hypothesis 1b: The firms deteriorate in performance by diversifying into unrelated industries.

3.2.2 Vertical versus Horizontal Relatedness

Apart from the relatedness of diversification, the survey paper by Dhir and Dhir (2015) emphasises the important differences between several types of relatedness. Dhir and Dhir (2015) maintain that very few papers study the finer classification of relatedness. The meta-analysis of Palich et al. (2000) does not provide a specific

definition of relatedness, but rather synthesises prior studies' respective definitions. Prior research's classification of relatedness is crude, very often made by looking at whether two business units share the first two-digit industry code (Fan and Lang, 2000). We attempt to provide a finer classification of relatedness. Most prior relatedness studies focus on product and market relatedness (Palich et al., 2000), while few papers study resource relatedness. Value chain stages are employed to reflect the managerial relatedness and production relatedness, which are two dimensions of resource relatedness (Weiss, 2016).

From the value chain relatedness perspective, resource relatedness includes horizontal and vertical relatedness from the value chain perspective. By unpacking resource relatedness, the related diversification can be further subdivided into vertical and horizontal diversification (including concentric as there is little distinction between them) (Chan et al., 1997; Strange and Yang, 2016). Vertical businesses, including both upstream and downstream businesses, are related to the core business through the value chain activity. Core business' input and output are the upstream businesses' output and downstream businesses' input respectively (Fan and Lang, 2000). Horizontal businesses (sharing the same first 3-digit industry code with the core business) produce the same products as the core business (Strange and Yang, 2016).

Prior research typically regards relatedness as the similarity; however, it ignores the importance of complementarity. Synergies are not only derived from transferring similar resources, but also generated from a complementary resource set (Harrison et al., 2001). Horizontal business is more likely to create synergies related to resource similarity. Horizontal business produces a final product that is very similar to the core product and needs similar resources for production and sales. The joint utilisation and sharing of resources among horizontal business and core business lead to the synergies. These synergies, related to similarity in resources, have been studied in many papers, as emphasised in (Palich et al., 2000) and (Weiss, 2016). On the other hand, vertical business is more likely to generate synergies related to resource

complementarity. Prior studies typically ignore the importance of synergies related to complementarity in resources. Therefore, we focus on the discussion of vertical relatedness.

As a vertically disintegrated firm, the procurement department of the core business buy input from upstream affiliates, and the sales department of core business sells output to downstream affiliates. The materials and products flow through the vertical structure (upstream-core-downstream businesses). This internal trade improves efficiency of resource allocation in the internal market (e.g., the flexibility in capital and labour markets), which outperforms the external market, since the headquarters has superior access to the information than the external market (Ramanujam and Varadarajan, 1989; Servaes, 1996; Fan and Lang, 2000; Palich et al., 2000).

Through greater control of the value chain by disintegrating the upstream and downstream activities, vertical related diversification can bring vertical economies deriving from the reduced management costs and capture of value-added margins throughout the value chain (Ginsberg, 1990).

Vertical relatedness is negatively related to outsourcing. The more the firm outsources, the more the firm gives up its partial control of the supply chain; this makes it difficult for the firm to coordinate external partners when there is supply chain disruption. By acquiring suppliers such as those providing raw materials, the firm obtains more internal control over its input and output, and is therefore less reliant on external value chain partners. Firms with a high level of vertical relatedness have more operational flexibility in the event of a supply shock (Hendricks et al., 2009). Moreover, like make a stronger basket, vertical related diversification reduces systematic risk, since the vertically disintegrated firms are less sensitive to changes in the macro-environment (Shackman, 2007).

Apart from the enhanced positive effect of vertical related diversification, it also has greater negative effects. The vertical relatedness structure restricts a firm's ability to restructure and downsize to enhance performance. The firm is slower to

adjust production activity and firm structure to improve firm performance when there is an external shock (Fan and Lang, 2000). Moreover, similar to putting all your eggs in one basket, the firm's resources are concentrated on producing one final product. The firm relies highly on the success or failure of one final product.

There is insufficient empirical evidence on the vertical relatedness' effect on the product diversification-performance link, with few exceptions (Fan and Lang, 2000; Hendricks et al., 2009). Fan and Lang (2000)'s findings support the view that vertical disintegration is associated with the low excess value of the firm. Hendricks et al. (2009) find that vertical relatedness can reduce the negative effect of a supply chain disruption announcement on the stock market's reaction. (Kumar, 2013) finds that the core business performance is enhanced when its segments are vertically disintegrated with the core business. In addition, there is a lack of empirical evidence on the curvilinear relationship between vertical diversification and firm performance.

Again, we adopt Haans et al. (2016)'s approach, especially considering the two countervailing latent mechanisms that determine the relationship between related product diversification and performance.

On the one hand, the enhanced synergies resulting from resource complementarity of vertical relatedness reinforce the positive effect of product diversification on firm performance. Through acquiring suppliers in the value chain to improve the internal control of its input (e.g., raw materials) and output (e.g., final product), vertically disintegrated firms are able to reduce market transaction costs by creating the an intermediate product market (Fan and Lang, 2000). Vertical diversification also creates financial synergies by effectively allocating the capital in the internal capital market. Moreover, the vertically disintegrated firms developed operational flexibilities in the event of supply chain disruption. This is unlikely in the case of outsourcing, where a firm's dependence on the external partner makes it difficult to secure the supply of its input and demand for its output, particularly in the event of supply chain disruption (Hendricks et al., 2009). The firm can also experience reduced systematic risk due to less sensitivity to the macro-environment.

As a firm holds a diversified product portfolio with a strong presence in vertical related products, its performance is likely to benefit from cost efficiency, enhanced financial synergies, operational flexibility and reduced systematic risk. These effects strengthen the benefit curve at a low level of diversification and sharpens the curve at a high level of diversification. This is because firms can achieve greater synergies after they obtain experience and knowledge of effectively transferring the resource across product lines. This is illustrated by the strengthened latent mechanism of diversification benefits.

However, the positive effect on firm performance is strengthened at a low level and weakened at a high level of diversification when diversifying into horizontal related products. Unlike vertical diversification that relies on resource complementarity, horizontal diversification relies more on resource similarity. Horizontal diversification is effective in the exploitation of synergies through the joint utilisation and sharing of similar resources (tangible resources such as equipment, intangible resources such as technology and brand). However, there are limits to resource similarity. First, the value of common input (know-how) might be impaired by frequent transfers. Second, the simultaneous transfer of the same know-how to multiple applications may be associated with increased access costs. The congestion in accessing common input will limit the extent to which economies of scope can be exploited by diversified firms, thus limiting the benefits of related diversification (Teece, 1980). Therefore, the benefits of resource similarity are growing at a decreasing rate.

On the other hand, the negative effects on firm performance are enhanced at every level of diversification when firms are investing in vertical related products. The vertical relatedness structure limits the firm's ability to restructure and downsize to improve performance, leading to high adjustment costs of restructuring. Also, the firm's resources are concentrated in one core product and other intermediate products in the value chain, relying heavily on one product's success or failure. Thus, the firm faces larger unsystematic risk (Shackman, 2007). Consequently, we could expect a steeper costs curve at a low diversification level, and a smoothed

down curve at a high diversification level since the firms face fewer liabilities of negative transfer at a high level of diversification. This could be demonstrated by the sharper latent curvilinear mechanism.

However, the negative effects on firm performance are weakened at a low level and strengthened at a high level of diversification when diversifying into horizontal related products. At a low level of diversification, the operation of horizontal businesses is easier than that of vertical businesses. Horizontal businesses use the same knowledge and produce the same products as the core business, both of which share the same first 3-digit industry code. Thus, managing a number of horizontal businesses is easier than that of vertical businesses, whose input and output are quite different from those for the core business (Carr et al., 2001). Therefore, without too much effort on modification, the firm can easily replicate its operations in the core business and use them in the new horizontal business. This cost increases at a growing rate due to the accelerating coordination issues and other organisational diseconomies.

Subtracting such negative effects from the positive effects of diversification in vertical related products creates a U-shaped relationship between vertical related diversification and performance. When comparing the net effect of vertical related diversification with that of related diversification, it indicates the different turning points of the two PD-P relationships. The turning points tends to shift to the left, together with the steepening U curve, indicating that the positive effect will occur earlier when investing in vertical related products. The U-shaped relationship between horizontal related diversification and performance is weakened due to the different growing pattern of the benefits (resource complementary vs. resource similarity) and costs (liabilities of negative transfer vs. coordination issues) as mentioned above. Accordingly, we state our second set of hypotheses.

Hypothesis 2a: Diversification has a larger positive effect on performance for firms' investment in vertical related products. This positive effect of diversifying into vertical related industries will occur at a lower level of diversification.

Hypothesis 2b: Horizontal related product diversification has a weaker U-shape relationship with firm's financial performance.

3.2.3 Upstream versus Downstream Relatedness

Aside from providing a finer classification of relatedness, particularly comparing the vertical and horizontal relatedness, the survey papers by (Benito-Osorio et al., 2012; Dhir and Dhir, 2015) suggest a lack of studies on upstream and downstream relatedness. The few extant vertical economies studies (Fan and Lang, 2000; Hendricks et al., 2009) treat vertical relatedness as a whole, and disregard the differences between upstream and downstream relatedness. Upstream and downstream subsidiaries rely on different organisational resources and create different synergies across the firm's product scope: they are playing different roles in an MNE. Upstream subsidiaries are often knowledge-intensive; they provide the R&D product and quality intermediate input such as raw materials. Meanwhile, downstream subsidiaries are often the listening post for a firm; they often collect the latest information about the demand in the final market (Sun and Ni, 2012). Therefore, the distinction between upstream and downstream diversification would allow us to analyse a whole aspect of vertical diversification, suggesting a novelty in diversification literature (Heras et al., 2010).

By further unpacking the vertical relatedness, vertical diversification could be further categorised into upstream and downstream diversification, as firms diversify along the stages in a value chain by incorporating the production of the upstream and downstream products within the firm (Boehm et al., 2016). Upstream diversification takes place when a firm extends its industry activities into the inputs point of the value chain or gain ownership of one of its suppliers. Downstream diversification occurs when a firm extends its industry activities into the output point of the value chain or gains ownership of one of its customers, such as retailers (Grunig and Morschett, 2012; Gao, 2015). Upstream diversification allows the firm to control the quality of supplies by being closer to the source of raw materials in the

position of value chain. Downstream diversification allows the firm to control the distribution process of the products by getting closer to the customers (Weidenfeld, 2018). Take the petroleum industry as an example. Upstream diversification occurs when petroleum firms acquire crude oil suppliers. Downstream diversification could mean that petroleum firms take over the control of pipelines (Edwards et al., 2000).

Both upstream and downstream diversification help firms gain synergies derived from resource complementarity, instead of resource similarity. Upstream diversification allows firms to enter an earlier stage of the value chain. In contrast, downstream diversification allows firms to enter a later stage of the value chain, controlling distribution channels, reducing transportation costs and saving middleman's (e.g. broker) profits (Al-Bostanji, 2015). Upstream diversification increases a firm's efficiency through the control of supply, reducing the delay in the supply chain while downstream diversification increases the efficient utilisation of resources (Hendricks et al., 2009). Moreover, upstream diversification helps the firm reduce dependence on upstream suppliers and enjoy control over its supplies. Downstream diversification helps the firm reduce dependence on downstream buyers and enjoy control over the distribution of its products (Gandia and Gardet, 2018).

Upstream alliance partnerships have a positive impact on technology firm's invention success (Dutta and Hora, 2017). We extend this argument to diversification studies. Similar to upstream alliance partnerships, firms that have upstream subsidiaries succeed in developing new products. Meanwhile, downstream activities provide the firm with access to distribution channels, marketing and financing resources that may help the commercial success of a product or process (Kogut, 1983; Yang et al., 2014; Dutta and Hora, 2017). Downstream activities are typically associated with economies of scale and scope (Silverman and Baum, 2002).

Both upstream and downstream subsidiaries generate knowledge. The upstream subsidiaries invest heavily in R&D and develop innovative products that might substantially improve the firm's competitiveness in the market. The downstream subsidiaries have expertise in selling products and also collecting some market in-

formation about the market demand and trends (Gupta and Govindarajan, 2000).

However, upstream diversification has more benefits than downstream diversification. In general, the knowledge seems to flow in a direction that is the same as the intermediate goods flow throughout the vertical value chain. This is from upstream to downstream subsidiaries, but not the other way around. The firm learns more from upstream activities. The knowledge transfer happens in a top-down fashion in most MNE networks (Gupta and Govindarajan, 2000). From the knowledge generation strategy point of view, the firm is inclined to vertically integrate the upstream businesses. The vertical knowledge flow from upstream to core activities contributes to corporate growth (Antonelli, 2006). Firms are more productive, when learning from more adjacent upstream suppliers in the same region. A similar effect cannot be found for firms near the downstream plants (Lopez and Suedekum, 2009).

We extend this argument to diversification studies. Similar to adjacent upstream suppliers, the multi-product firm learns more from upstream subsidiaries, improving the firm's productivity. Moreover, upstream activities provide the firm with the source of technology and knowledge. For instance, the firm's upstream linkage with universities and other research institute give the firm access to research expertise that is essential for discovering and developing new products and patents. Upstream diversification also forecloses rival's access to technological resources, therefore enhancing the firms' competitiveness in the market (Silverman and Baum, 2002). Upstream diversification often leads to world-leading innovative performance, based on the accumulative innovative capabilities (Figueiredo, 2014).

Upstream subsidiaries not only provide innovative R&D products, but also provide high quality intermediate inputs (e.g., raw materials). There is uncertainty in the supply of intermediate inputs (Arrow, 1975). In the face of uncertainty, by incorporating upstream subsidiaries, the firm has the ability to forecast the input price and make a better decision on input mix. The firm can avoid uncertainty and minimise the costs derived from demand fluctuations (Isaksen, 2007). Quality difference and insufficient supply often incur huge fluctuation in scrap costs (Boyd

and Gove, 2000). Moreover, upstream relatedness also eliminates the distortion in input costs resulting from an upstream monopoly (D'Aveni et al., 2004) or factor market failure (Li et al., 2006). In addition, through the effective control of supply, firms can reduce the costs of delay in the supply chain (Hendricks et al., 2009).

Apart from the larger positive effect of upstream diversification, it also has greater negative effects. The upstream activities such as R&D projects are usually long-term and involve huge investment. The outcome of R&D is uncertain and there is a high likelihood of failure (Singh and Gaur, 2013).

There is insufficient evidence on upstream and downstream diversification's effects on firm performance, with a few exceptions. For instance, Upstream linkages are associated with higher productivity compared with downstream linkage; this is perhaps because upstream linkages have stronger effect on product adoption (Lopez and Suedekum, 2009; Boehm et al., 2016). (Edwards et al., 2000) find that petroleum company's performance (i.e., stock rating) strongly improves when diversifying into crude oil production (upstream diversification), while pipeline integration (downstream diversification) has a weaker positive effect. Moreover, vertically integrated dominant business firms receive high market evaluation of its R&D investment due to their pursuit of synergy (Hoskisson and Hitt, 1988). Upstream diversification reduces the introduction of new products. Downstream diversification does not have a significant effect on new product innovation (Heras et al., 2010). Further, In the EU agriculture industry, downstream linkages with food processing outperform the upstream linkages with input providers. The economic significance of upstream diversification perhaps comes from conveniently managing the feed industry directly on a large scale. The EU food and beverage industry find it difficult to exploit upstream diversification, since there is a high barrier for it to enter upstream industry (agriculture) (Chang and Iseppi, 2012). In addition, there is a lack of empirical evidence on the curvilinear relationship between upstream or downstream diversification and firm performance.

We compare the relationships between product diversification and performance,

namely upstream and downstream related diversification. We contend that the upstream relatedness magnifies the two latent mechanisms behind the U-shaped PD-P relationship.

On the one hand, the positive effect of diversification is stronger when diversifying into upstream products than into downstream products, since larger synergies derived from resource complementarity of upstream vertical relatedness reinforce the positive effect of product diversification on firm performance. Both upstream and downstream diversification help firms gain synergies through the utilisation of complementary resources. Upstream diversification could help firms have greater control of resource supply required for its core business activities, and reduce the dependence on upstream supplier, while downstream diversification could provide firms with the access to market, reduce the dependence on downstream buyers, and help the firm bypass distribution bottlenecks and information bottlenecks (Gandia and Gardet, 2018).

However, the positive effect of vertical diversification is smaller when diversifying into downstream products, since the benefits of downstream diversification are limited, while upstream diversification has more benefits. In most MNE networks, the knowledge flow happens in a top-down fashion. By learning from upstream activities, firms become more productive (Lopez and Suedekum, 2009). From the knowledge generation strategy point of view, the vertical knowledge flow from upstream to core activities contributes to the corporate growth (Antonelli, 2006). Upstream activities provide the firm with the source of technology and knowledge, foreclosing rival's access to technological resources, and enhancing the firm's competitiveness in the market by constantly developing new products and patents (Silverman and Baum, 2002).

Moreover, Upstream activities help the firm avoid uncertainty in quality of inputs and provide sufficient supply (Boyd and Gove, 2000; Isaksen, 2007). Upstream relatedness also eliminates the distortion in input costs (D'Aveni et al., 2004; Li et al., 2006). Further, firms can reduce the costs of delay in the supply chain through the

effective control of supply (Hendricks et al., 2009). As a firm possesses a diversified product portfolio with a strong presence in the upstream products, its performance is likely to benefit more from knowledge transfer, innovative capabilities, quality certainty, mitigated input costs distortion and reduced delay in the supply chain. In contrast, the firm's performance tends to benefit less from downstream relatedness's limited benefits, namely control of the distribution channel and access to the product markets. Compared with downstream relatedness, these effects of upstream relatedness strengthen the benefits curve at a low level of diversification and sharpen the curve at a high level of diversification. This is because firms can achieve greater synergies after they gain experience and knowledge of effectively transferring the resource across product lines. This is illustrated by the strengthened latent mechanism of diversification benefits.

On the other hand, the negative effect of vertical diversification is bigger when diversifying into upstream products. Although both diversifications face the costs of potential reduced market efficiency by giving up the opportunities to buy input and sell output to external suppliers and customers (Kumar, 2013), the upstream diversification incurs more costs. Upstream activities, such as R&D investment in innovation projects, are expensive and risky, and the outcome is uncertain since there is a high likelihood of failure (Singh and Gaur, 2013). Consequently, we could expect a steeper costs curve at a low diversification level, and a smoothed down curve at a high diversification level. This is because the firm faces fewer liabilities of negative transfer at a high level of diversification. This could be illustrated by the sharper latent curvilinear mechanism.

Subtracting such negative effects from positive effects of diversification in vertical upstream related products created a U-shaped relationship between upstream diversification and performance. When comparing the net effect of upstream diversification with that of downstream diversification, it indicates the different turning points of the two PD-P relationships. The turning points tends to shift to the left, together with the steepening U curve, indicating that the positive effect will occur

earlier when investing in upstream related products than in downstream related products.

Hypothesis 3: Diversification has a greater positive effect on performance for firms' investment in upstream than in downstream vertical related products. This positive effect of diversifying into upstream vertical related industries will occur at a lower level of diversification than in downstream vertical related industries.

3.3 Method

3.3.1 Data

Our data are drawn from Orbis Database, which is owned and maintained by a large international consultancy company called Bureau van Dijk. This database provides detailed accounting and financial information of firms all around the world.

This database records each firm's NACE Rev.2 core code, primary code and secondary code. NACE code is one kind of industry classification, whose full name is Statistical Classification of Economic Activities in the European Community. This industry classification is sponsored by European Community. We regard core code as the firm's core business, the other codes as the firm's other business (could be related or unrelated businesses). Orbis also records each firm's majority owned subsidiaries (minimum 50.01 per cent equity are controlled by the parent). To fully capture the product diversity of the firm, we take into account all industry codes of parent and majority owned subsidiaries. Then we count all industry codes to calculate the proxy of product diversification (defined as the number of segments). The accounting information of the firm is available from 2004 to 2013, but the product diversification measure is only available in the last available year in the dataset, which mostly are 2012.

Following previous diversification literature (Grant et al., 1988; Tallman and Li, 1996; Majocchi and Strange, 2012) and due to the limit information of value chain position in the service sector, which is essential in distinguishing between vertical

and horizontal diversification, we decide to focus on manufacturing firms for our analysis. We choose manufacturing firms that have information on return on assets, number of employees, leverage, sales, country, and industry code of parent and majority owned subsidiaries. Firms with any these variables that has missing value are ruled out from our sample. The final sample contains 12,357 firms. All monetary variables are reported in US dollars.

3.3.2 The Empirical Specification

Following Grant et al. (1988) and Qian (2002)'s approach, multiple regression models with fixed effect estimators are employed. To examine the related product diversification-performance (RPD-P) and unrelated product diversification-performance (UPD-P) relationship (hypotheses 1a-1b), we introduce the following equations.

$$Y_i = \beta_1 RPD_i + \beta_2 UPD_i + \lambda X_i + \gamma_t + \epsilon_i, \tag{3.1}$$

$$Y_i = \beta_3 RPD_i + \beta_4 RPD_i^2 + \beta_5 UPD_i + \beta_6 UPD_i^2 + \lambda X_i + \gamma_t + \epsilon_i, \tag{3.2}$$

The key parameter β_2 in equation 1 is to test the linear negative effect of UPD. It is crucial to include the second-order term in equation 2. A significant positive β_4 indicates a U-shaped relationship, while a significant negative β_4 suggests an inverted U-shaped RPD-P relationship (Meyer, 2009; Haans et al., 2016).

To examine the impact of finer classification of relatedness (e.g., vertical vs. horizontal relatedness) on related product diversification-performance (RPD-P) relationship (hypotheses 2a-2b), the following equation is introduced.

$$Y_i = \beta_7 VRPD_i + \beta_8 VRPD_i^2 + \beta_9 HRPD_i + \beta_{10} HRPD_i^2 + \beta_{11} UPD_i + \beta_{12} UPD_i^2 + \lambda X_i + \gamma_t + \epsilon_i, \tag{3.3}$$

We introduce the second-order terms of VRPD, HRPD and UPD in equation 2

to test the nonlinear RPD-P relationship when considering vertical and horizontal relatedness. The main focus is the parameters β_8 and β_{10} with respect to hypotheses 2a and 2b.

To examine the impact of finer classification of vertical relatedness (e.g., upstream vs. downstream relatedness) on vertical related product diversification-performance (VRPD-P) relationship (hypotheses 3a-3b), the following equation is presented.

$$\begin{aligned} Y_i = {} & \beta_{13} UVRPD_i + \beta_{14} UVRPD_i^2 + \beta_{15} DVRPD_i + \beta_{16} DVRPD_i^2 \\ & + \beta_{17} HRPD_i + \beta_{18} HRPD_i^2 + \beta_{19} UPD_i + \beta_{20} UPD_i^2 + \lambda X_i + \gamma_t + \epsilon_i, \end{aligned} \tag{3.4}$$

We again introduce the second-order terms in equation 2 to test the nonlinear VRPD-P relationship when considering upstream and downstream relatedness. The key parameters are β_{14} and β_{16} with respect to hypotheses 3a and 3b. The main variables in the equations are explained as the following.

Dependent variable. Y_i refers to firm performance. In the past four decades of product diversification literature, both accounting measures (e.g., return on sales, return on equity and return on assets) and market-based measures (e.g., Tobin's q and excess value) are used in of PD-P literature. We use accounting-based measure return on assets using net income (PERF). Return on assets remains the widely used performance measure in strategy management literature (Grant et al., 1988; Lubatkin and Chatterjee, 1994; Mayer and Whittington, 2003; Benito-Osorio et al., 2015). Using this approach is convenient for comparing results with other studies. Return on sales, return on equity and return on assets are highly correlated, generating similar results (Tanriverdi and Venkatraman, 2005; Benito-Osorio et al., 2015). Marketing-based measures are abandoned since these data are lacking and not available for all countries (our country coverage is 63 economies).

Explanatory variables. Our paper employs the number of segments (PD) as a proxy for product diversification. Several measures based on industrial classification code have been developed in the previous literature, including Herfindahl measure, entropy measure, Rumelt's categories and the number of segments (Palich et al.,

2000). The popular measures of diversification in strategic management research would be entropy and Herfindahl (Majocchi and Strange, 2012). They capture not only the number of segments where the firm operates but also the size of operation in each segment (Kim et al., 1989; Hitt et al., 1997). They are found to generate results similar to those based on Rumelt's categories. However, these three measures highly rely on the detailed data of operation size in each segment, which is not available from Orbis after we explore its data availability. Instead, we employ the number of segments as the measure of product diversification. The number of segments is not perfect, but is the only feasible measure using Orbis data. Besides, the number of segments is a common measure of product diversification (Lang and Stulz, 1994; Palich et al., 2000; Schmid and Walter, 2009; Hoechle et al., 2012). The number of segments measure typically uses industrial classification code to identify industries where the firm operates in, and uses the number as a measure of diversification (Datta et al., 1991). Orbis reports the firm's core, primary and secondary NACE Rev.2 industry code. We calculate the PD by taking the sum of all three kinds of industry codes (4-digit level) reported by both parent and majority owned subsidiaries (at least 50.01 per cent owned by parent) (Shaban and James, 2018).

To reveal the relatedness between products, we analyse the inter-industry linkages between different products using the input-output table. Earlier studies' measure of relatedness relies mostly on the hierarchical structure of industrial classification system (e.g. SIC) (Varadarajan and Ramanujam, 1987; Aleson and Escuer, 2002). The closer the new product and the core product appear in the classification system, the more related these two products are believed to be. For instance, they regard a new product is related to the core product if they share the same first two-digit industry code, while products from different 2-digit industry groups are consider unrelated. This SIC-based measure is crude and receives a lot of criticism. Due to the drawbacks of this SIC-based measure, a more precise measure of industry relatedness based on upstream and downstream linkages in input-output tables has

been developed (Fan and Lang, 2000). Upstream activities provide intermediate input such as raw materials, research and development (R&D) outcome. Based on the industry intermediate input tables provided by the Office for National Statistics, we regard upstream products as those products whose primary industries account for at least 1% of total intermediate inputs to the firm's core industry. R&D activity is always regarded as an upstream activity. Horizontal activities share the same first three-digit NACE industry code with the firm's core activity. They tend to share similar resources (e.g. skills and technology) when producing and selling the same product. Downstream activities are in wholesale and retail trade (NACE industry codes 45, 46 and 47). Advertising and market research (NACE industry code 73) is regarded as a downstream product to a firm. Lastly, all the other products that have little added value to the focal firm's view of value chain is considered as unrelated products.

In order to examine the effects of various forms of related PD on firm performance, following Chang and Hong (2000) approach, we divide diversification into two components, namely related diversification (RPD) and unrelated diversification (UPD), such that PD = RPD + UPD. We calculate RPD as the number of related business segments, and UPD as the number of unrelated business segments. We define the related businesses as businesses that are related to the firm's core business, including horizontal and vertical businesses. All other businesses are defined as unrelated businesses.

To capture the effects of value chain disintegration on product diversification-performance link, RPD is separated into two components, namely vertical related diversification (VRPD) and horizontal related diversification (HRPD), such that RPD = VRPD + HRPD. Horizontal business shares the same first three-digit industry code with the core business (Chan et al., 1997), using the same knowledge and producing the same products as the core business. Vertical business provides the input (e.g., raw materials, R&D products) to firm's core business and buy the output (e.g., semi-finished goods) from core business.

To capture a whole aspect of vertical diversification, similarly, VRPD is further divided into two components, namely upstream diversification (UVRPD) and downstream diversification (DVRPD), such that VRPD = UVRPD + DVRPD. Upstream business is mostly for intermediate inputs and part of home market production chain (Keller and Yeaple, 2013). Downstream business is mostly for marketing and sales purpose (Delios and Beamish, 2001; Yang et al., 2014).

Control variables: We control several variables that are believed to affect firm performance, including firm size, leverage and labour productivities. Large firms are inclined to have better performance than small firms (Li, 1995). Our paper measures the firm size (SIZE) by the number of employees (Tanriverdi and Venkatraman, 2005). Liquidity indicates the firm's available financial resources to finance its investment in the diversification. In line with the literature, we used current ratio, calculated as current assets divided by current liabilities, to measure liquidity (LIQ) (Chang and Hong, 2000). Financial leverage is another common factor that is widely used in the literature. It can negatively affect firm performance, since risky debts make firm give up value-adding investment opportunities, leading to sub-optimal investment strategy (Myers, 1977). Leverage (LEV) is calculated by dividing the sum of non-current liabilities and loans by shareholder funds (Chao and Kumar, 2010). Labour productivity tends to be positively associated with firm performance, which measures how much sales each employee can generate. Labour productivity (PROD) is measured by total sales to the number of employees (Yang et al., 2014). Firm age represents firm's experience, which might affect the technological learning, foreign activities and international experience (Zahra et al., 2000). We calculate the firm age (AGE) as the operation duration since the starting date of the firm.

We control country level characteristics (Li and Qian, 2005) including institution (INST) and GDP growth (GROW). Firms in countries with poor institution are more likely to create internal market through forming business group/multi-product firms in face of domestic institutional void (Gaur and Kumar, 2009). We control

home country's institution (INST), which is calculated as the average of six dimensions in Worldwide Governance Indicators (Ang et al., 2015). We take the natural logarithm of the firm size, labour productivity and age (plus 1 since the logarithm is not defined for zero) (Majocchi and Strange, 2012) to normalise their distribution. We also control several fixed effects that may be the unobserved macroeconomic factors affecting firm performance, including time (γ_t), industry and country fixed effects (Yang and Kwong, 2013). Table 3.1 provides definitions and data sources of the variables used in the empirical models.

3.4 Results

3.4.1 Descriptive Statistics

Table 2 presents descriptive statistics. There are a total of 12,357 manufacturing firms in the sample. As we can see from the left panel, with respect to the level of product diversification, on average, a firm has diversified into 5.32 industries. Chang (1996) study, which is about eight industries, presents similar statistics. In terms of types of product diversification, 3.17 industries out of these 5.32 industries are related industries (including horizontal, and vertical industries), while 2.16 industries are unrelated industries (conglomerate industries).

Concerning the value chain position, the related industries are divided into two groups, including horizontal industries and vertical industries. Within the related product diversification (3.17) category, 0.19 industries are horizontal industries, while 2.98 industries are in vertical industries. Similarly, within the vertical related product diversification category, 0.87 industries are upstream industries, 2.10 industries are downstream industries. With regard to performance and firm characteristics, on average, a firm has a return on assets of 2.49%. In addition, a firm has a labour force of around 2,562 employees. The labour productivity is US$767.40 thousands sales per worker. The average leverage ratio is 106%.

The correlation matrix in Table 3.2 shows that most correlation coefficients are

low, except for the correlation coefficient 0.63 between UPD and RPD, and 0.63 between UPD and VRPD. If these variables are run in the same regression models and then in separate regression models, the results remain the same (we just show the results that are run in the same regression models for briefness).

The data consists of 63 economies, mainly G8 countries, many large developed and emerging economies. Table 3.13 (in Appendix A) presents the country distribution and the mean for the main variables in our paper, including ROA, PD, UPD, RPD, HRPD, VRPD, UVRPD and DVRPD. Firms from Hungary, Czech Republic, and Switzerland have a higher product diversification (on or above 10) than other economies. The majority of firms come from developed economies and large emerging economies, including Italy, Spain, US, Germany, Japan, UK, Sweden, Belgium and China, which account for 74.32% of all firms in our sample.

3.4.2 Regression Results

Table 3.3 presents the main results. The F-statistics are all significant across all models, suggesting all models are significant. The adjusted R squared is about 14%, indicating 14% of the variance of firm performance (PERF) can be explained by these models. All controls are significant and have the expected signs. Firm size (SIZE) has significant positive signs, suggesting that larger firms are associated with higher performance. Labour productivity (PROD) also have significant positive signs, suggesting that firms with more productive labour have better performance. However, the leverage (LEV) has a negative coefficient, suggesting more debts and less equity are detrimental to firm performance.

Models 1-2 are the baseline model. We find (from Model 1) that production diversification (PD) has a significant negative coefficient of -0.0418, suggesting that total production diversification has a negative effect on firm performance, when firm characteristics are controlled in the model. Model 2 is to test the curvilinear relationship on the total product diversification-performance link. This model reports a negative coefficient of PD (-0.1630, significant at the 1% level), while a

positive sign of PD squared (0.0045, significant at the 1% level), indicating that there is a U-shaped relationship between product diversification and performance. The turning point is 18.11 industries. This indicates that firms experience negative performance before the synergies outweigh the costs of diversification.

Models 3-4 are to test hypotheses 1a and 1b. Let us now turn to our key variable RPD, which is the measure of production diversification. Model 4 is to test the curvilinear relationship on the product diversification-performance link. This model reports a negative coefficient of RPD (-0.2077, significant at the 1% level), while a positive sign of RPD squared (0.0124, significant at the 1% level), indicating that there is a U-shaped related product diversification-performance (RPD-P) relationship. The turning point is 8.38 industries. This indicates that firms experience negative performance at initial stage of related product diversification. However, after reaching a turning point of 8.38 industries, the firm enjoy improving performance as the synergies outweigh the diversification costs.

We find (from Model 3) that UPD has a significant negative coefficient of -0.0831, indicating a linear negative unrelated product diversification-performance (UPD-P) relationship. The more unrelated products in the corporate portfolio, the greater loss a firm will suffer since it needs to develop quite different strategic capabilities and deal with great costs in managing complex operations. We interpret that related diversification creates larger synergies than unrelated diversification. These synergies come from the utilisation of complementary or similar resources. These results are consistent with some studies that support the superiority of related diversification over unrelated diversification (Mayer and Whittington, 2003; Tanriverdi and Venkatraman, 2005). Overall, Models 3-4 support the hypothesis 1a and 1b.

Models 5-6 are to test hypotheses 2a and 2b. We find (from Model 6) the negative coefficient (-0.2246) of the linear term and positive coefficient (0.0137) of the squared term for vertical related diversification (VRPD), both of which are significant at the 1% level, suggesting the non-linear relationship between vertical related diversification and performance (VRPD-P). The turning point is 8.20 indus-

tries. We find (from Model 6) that horizontal related diversification (HRPD) has insignificant linear and quadratic terms, suggesting weaker U-shaped relationship. Overall, the above results support hypothesis 2a and 2b. Firms who diversify into vertical related industries can improve performance after reaching a turning point of 8.20 industries. However, there is weaker evidence and unclear pattern for the horizontal related diversification. This shows the superiority of vertical diversification over horizontal diversification, indicating that the complementary resources (i.e. in vertical diversification) create more synergies than similar resources (i.e. in horizontal diversification). This positive effect on performance changes to negative after a turning point. Overall, the above results support hypotheses 2a and 2b.

In order to further unpack the effect of vertical related product diversification, and to test hypotheses 3a and 3b, we distinguish between upstream and downstream vertical related diversification to provide a further finer classification of vertical. We do this decomposition based on prior work (Chan et al., 1997; Strange and Yang, 2016), which emphasize that upstream and downstream relatedness are playing different roles in product diversification-performance link.

We find (from Model 7) that vertical diversification (DVRPD) has negative coefficients, resembling the negative effect of VRPD on performance. Horizontal diversification (HRPD) has an insignificant positive coefficient in a linear model. In the curvilinear model, we find (from Model 8) the negative coefficient (-0.2199) of the linear term and positive coefficient (0.0353) of the squared term for UVRPD, which are significant at the 10% and 1% level respectively, suggesting the U-shaped upstream vertical related product diversification and performance (UVRPD-P) relationship. The turning point is 3.11 industries. Meanwhile, we find (from Model 8) the negative coefficient (-0.1977) of the linear term and positive coefficient (0.0150) of the squared term for UVRPD, which are significant at the 5% and 1% level respectively, suggesting the U-shaped downstream vertical related product diversification and performance (DVRPD-P) relationship. The turning point is 6.59 industries.

These results suggest that the firms who diversify into upstream industries can

improve performance after reaching a turning point. This turning point occurs at lower level of diversification than that of downstream diversification. The firm can enjoy the positive effects of upstream diversification earlier than downstream diversification, suggesting the superiority of upstream diversification over downstream diversification. We conclude that, although both upstream and downstream diversification belong to the vertical diversification category, the former outperforms the latter. The benefits from resource complementarity of vertical related diversification are more pronounced in upstream rather than vertical relatedness. Overall, the results support hypotheses 3a and 3b.

As robustness checks of our primary results, we conduct several robustness tests. First, the relative strength of two countervailing effects might vary several times within the range of variable in certain curvilinear relationships, suggesting higher function forms (e.g., cubic). For example, in inverted S-shaped relationship, the positive effect prevails at low and high levels while the negative effect prevails at moderate level (Meyer, 2009). Following Haans et al. (2016) and Meyer (2009), to check whether the relationship is perhaps cubic rather than quadratic, we added a third-order term and propose the following equation. Table 3.4 presents the results that the third-order term is not significant (except horizontal diversification) and did not improve the model fit, therefore strongly supporting the quadratic relationship.

$$Y_i = \beta_1 PD_i + \beta_2 PD_i^2 + \beta_3 PD_i^3 + \lambda X_i + \gamma_t + \epsilon_i, \tag{3.5}$$

Second, we consider different ownership threshold. We restrict the sample by only including subsidiaries whose minimum 25.01 per cent (Kamal, 2015) or 10.01 per cent (Yang and Kwong, 2013) shares are owned by their parents. Moreover, we consider alternative performance measure, namely ROS (return on sales), ROCE (return on capital employed). Tables 3.5-3.6 shows the results that reaffirm the linear negative relationship for UPD, as well as the U-shaped relationship for RPD, VRPD, UVRPD, DVRPD, though the significance level of the linear terms become weaker.

Finally, we perform additional robustness tests to expand and explore further the effect of product relatedness on the returns from product diversification, particularly by considering characteristics of these manufacturing firms such as industrial context (Mayer et al., 2015), country context (Gu et al., 2018), size and age (Contractor et al., 2007). Generally, these results in Tables 3.7-3.10 support that the significance of U-shaped PD-P relationship varies across industrial context, country context, size and age. The turning points also vary for these different types of manufacturing firms. In Table 3.7 it is worthy of note that the upstream diversification's U-shaped effect on performance is more pronounced for firms in high-tech sectors, while downstream diversification's U-shaped effect on performance is more pronounced for firms in low-tech sectors. This seems to indicate the relative importance of R&D activities for high-tech firms and relative importance of marketing activities for low-tech firms.

In sum, we regard the results of robustness checks as supportive to our main findings. Product relatedness plays an important role on PD-P relationship. Unrelated diversification leads deteriorated firm performance. Diversifying into vertical (particularly upstream vertical) products improves performance after a certain level of diversification.

3.5 Discussion and Conclusions

The extant literature on product diversification-performance relationship almost exclusively uses the data from a specific country (mainly the US, or some other developed economies such as the UK or Japan). Their results might only be applicable to that specific chosen country. Our paper shows empirical evidence for manufacturing firms worldwide. Moreover, according to a survey paper by (Dhir and Dhir, 2015), the large PD-P literature gives limit attention to the performance implications of fine-grained measure of product diversification. Finer classification of product relatedness is important in measuring this product diversification, while extant literature is limited to the discussion of a rather broad concept of relatedness. Further, the existing PD-P literature is generally silent on the finer classification of

vertical relatedness (i.e., upstream and downstream relatedness) based on a value chain perspective. This paper aims to fill these knowledge gaps by analysing a large sample of over 12,000 firms in a large country scope of 63 economies.

This paper provides new empirical evidence on manufacturing firms worldwide, contributing to the existing PD-P literature, highlighting the importance of product relatedness, particularly the product location in the value chain. First, our primary finding is that the while unrelated diversification has linear negative impact on firm performance, related diversification has positive impact on firm performance after a turning point. This is consistent with Mayer and Whittington (2003) and Tanriverdi and Venkatraman (2005)'s finding, indicating the superiority of related diversification and that investing in related products could strengthen the performance improvement arising from synergies. Second, our main finding is that the while horizontal diversification has weaker U-shaped relationship with firm performance, vertical diversification has significant U-shaped relationship with performance. The vertical diversification has positive impact on firm performance after a turning point, which occurs at lower level of diversification. This is to some extent consistent with Hendricks et al. (2009)'s finding, indicating the superiority of vertical disintegration and that investing in vertical related products could strengthen the performance enhancement arising from synergies of resource complementarity in vertical diversification.

Our results emphasise the great benefits of investment in related products to firm's performance, particularly for investment in vertical related products, after the turning point of diversification. Related diversification has its unique synergies that unrelated diversification does not have, such as utilisation of complementary and similar resources. The positive effect of synergies helps firms realise the benefits of related diversification at the later stage of diversification. Moreover, the vertical relatedness is associated with costs efficiency derived from intermediate product market and internal capital market, operational flexibility and reduced systematic risk (Palich et al., 2000; Shackman, 2007; Hendricks et al., 2009), and this facili-

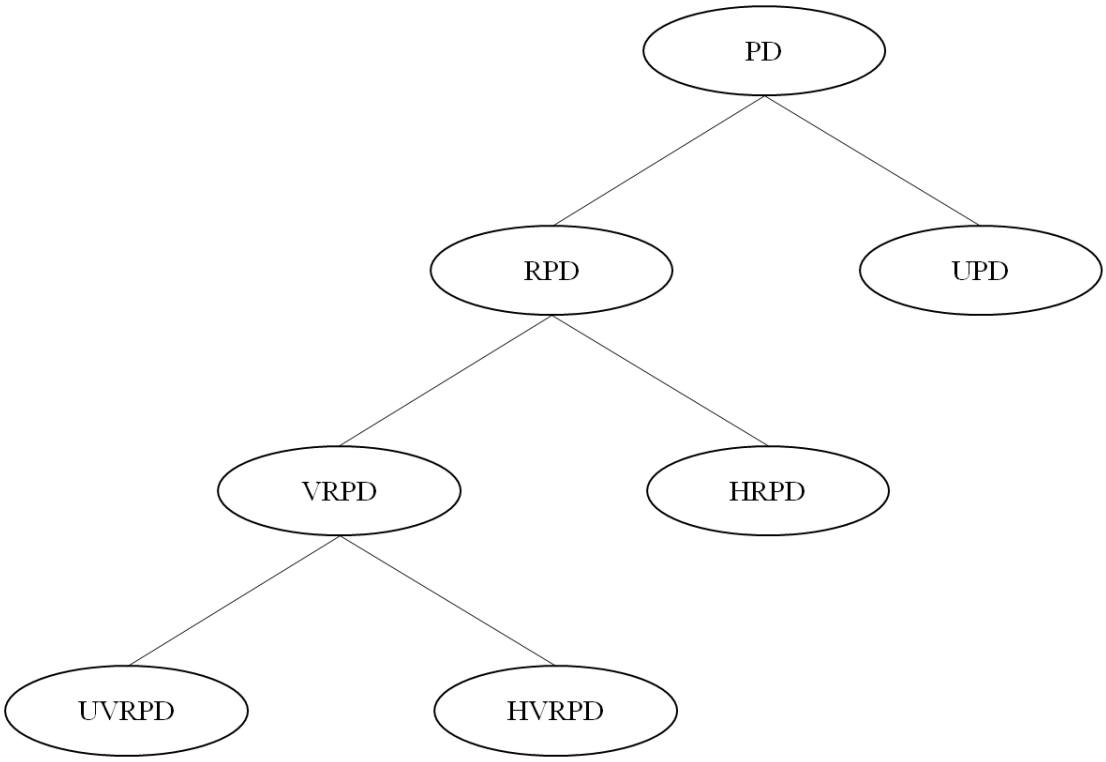
tate the resource complementarity in synergies generating, leading to performance enhancement. Therefore, with respect to the diversification strategy, firms are advised to establish a certain number of subsidiaries in vertical related products. We find that the negative effect of vertical related products will switch to positive at lower level of diversification (8.20 industries). Hendricks et al. (2009), for instance, find that vertical relatedness reduces the negative effect of supply chain disruption announcement on the stock market's reaction.

The final results suggest the vital effect of upstream diversification on firm's performance. It suggests the comparative success of upstream relatedness in the product diversification, relative to downstream relatedness. The positive effect of vertical related diversification occurs earlier for the firms who are investing in upstream vertical related products. The turning point shifts to lower level of diversification for investment in upstream products (3.11 industries), compared with downstream products (6.59 industries). Though both diversifications provide firm with synergies through the utilisation of complementary resources, such as the quality intermediate inputs from upstream subsidiaries and distribution channels from downstream subsidiaries. However, the synergies generated by upstream subsidiaries are larger than that of downstream subsidiaries. The firms benefit more from upstream activities, such as knowledge transfer, innovative capabilities, quality certainty, reduced input costs distortion and delay in supplies. In contrast, downstream activities provide the firm with limited benefits, such as control of distribution channels. This provides some evidence on firms' upgrading strategies (Schiller, 2011) and swimming upstream activities (Boehm et al., 2016). We believe our findings provide a better understanding of manufacturing firms' diversification behaviour. This is a surge of diversified investment by emerging multi-product giants from developed and developing countries (UNCTAD, 2016). Also, we believe that it has some vital managerial implications. It may help to explain, for example, why some firms are actively engaging in vertical disintegration, as well as why some firms are eager to upgrade its capabilities by investing in upstream products.

The limitation of our research is the cross-sectional rather longitudinal data, which prevents us from controlling the firm fixed effects. Also, our estimates do not rule out the endogeneity issue. Perhaps successful firms start to tap into other businesses. The huge success of its core business makes a firm over-confident and lets it try to replicate the core business' success in other businesses. Moreover, the number of segments is used as the measure of product diversification. However, this measure only captures the width of the product range; it does not capture the relative size of each segment. Future studies can try to use alternative measures, such as the Herfindahl and entropy index. Third, we have not considered the mode of diversification, including the internal development and external development (e.g., acquisitions). There is abundant research on level and type of diversification, while there are very few papers analysing the mode of diversification, which often interacts with the level and type of diversification. Finally, additional robustness tests would be helpful, such as considering other diversification measures. We give these topics for other scholars to consider in the future.

3.6 Tables and Figures

Figure 3.1: Finer Classification of Product Diversification Based on Relatedness



Notes: PD refers to total product diversification. UPD refers to unrelated diversification. RPD refers to related diversification. HRPD refers to horizontal related diversification. VRPD refers to vertical related diversification. UVRPD refers to upstream vertical related diversification. DVRPD refers to downstream vertical related diversification.

Figure 3.2: The Research Model

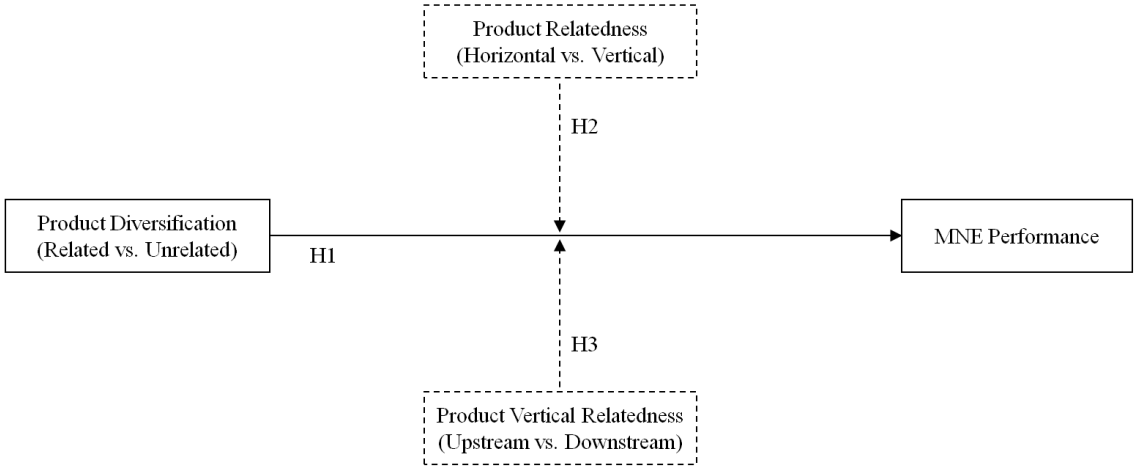


Table 3.1: Operationalization of Variables

Variable	**Operationalisation**	**Source**
PERF	The firm's return on assets using net income (%)	Orbis
PD	The natural logarithm of the number of segments (4-digit NACE Rev.2 codes) in parent and majority owned subsidiaries	Orbis
UPD	The number of unrelated segments in parent and majority owned subsidiaries	Orbis
RPD	The number of related (including horizontal and vertical related) segments in parent and majority owned subsidiaries	Orbis
HRPD	The number of horizontal related segments in parent and majority owned subsidiaries	Orbis
VRPD	The number of vertical related segments in parent and majority owned subsidiaries	Orbis
UVRPD	The number of upstream vertical related segments in parent and majority owned subsidiaries	Orbis
DVRPD	The number of downstream vertical related segments in parent and majority owned subsidiaries	Orbis
SIZE	The natural logarithm of the firm's number of employees	Orbis
LEV	The firm's debt to equity ratio	Orbis
LIQ	The firm's current assets to current liabilities ratio	Orbis
PROD	The natural logarithm of the firm's sales divided by the number of employees (US$)	Orbis
AGE	The duration of the existence since the date of incorporation	Orbis
GROW	The home country's GDP growth (%)	WDI
INST	The home country's institution score (average of six dimensions in WGI)	WGI

Table 3.2: Descriptive Statistics and Correlations Matrix

	Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	PERF	2.50	11.54	1.00														
2.	PD	5.32	6.03	0.04	1.00													
3.	UPD	2.16	2.95	0.03	0.88	1.00												
4.	RPD	3.17	3.73	0.05	0.92	0.63	1.00											
5.	HRPD	0.19	0.49	0.03	0.26	0.16	0.30	1.00										
6.	VRPD	2.98	3.61	0.05	0.92	0.63	0.99	0.18	1.00									
7.	UVRPD	0.87	1.51	0.02	0.64	0.43	0.70	0.12	0.71	1.00								
8.	DVRPD	2.10	2.76	0.05	0.85	0.58	0.92	0.17	0.92	0.38	1.00							
9.	SIZE	5.79	1.92	0.08	0.41	0.36	0.37	0.12	0.37	0.30	0.32	1.00						
10.	LIQ	2.67	10.40	0.04	0.00	-0.01	0.01	-0.01	0.01	0.00	0.01	-0.02	1.00					
11.	LEV	1.06	1.42	-0.18	-0.03	-0.03	-0.03	0.02	-0.04	-0.01	-0.04	-0.05	-0.05	1.00				
12.	PROD	12.58	0.98	0.17	0.00	-0.02	0.02	0.00	0.02	-0.02	0.03	-0.14	-0.02	0.05	1.00			
13.	AGE	3.26	0.82	0.07	0.08	0.04	0.10	0.08	0.09	0.09	0.07	0.17	0.02	-0.03	0.09	1.00		
14.	GROW	0.49	2.80	0.07	0.04	0.03	0.04	0.01	0.04	0.05	0.02	0.32	0.02	-0.09	-0.08	-0.04	1.00	
15.	INST	6.04	0.56	0.03	0.13	0.06	0.16	0.05	0.16	0.09	0.15	-0.06	0.04	-0.06	0.18	0.11	-0.03	1.00

Notes: All correlation coefficients above 0.10 is significant at over 10% level.

Table 3.3: Product Diversification and Financial Performance

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
PD	-0.0418**	-0.1630***						
	(0.018)	(0.048)						
PD^2		0.0045***						
		(0.001)						
UPD			-0.0831**	-0.0819	-0.0826**	-0.0767	-0.0818**	-0.0784
			(0.041)	(0.082)	(0.041)	(0.082)	(0.041)	(0.082)
UPD^2				-0.0008		-0.0010		-0.0005
				(0.005)		(0.005)		(0.005)
RPD			-0.0113	-0.2077***				
			(0.032)	(0.068)				
RPD^2				0.0124***				
				(0.003)				
HRPD					0.0576	0.2577	0.0590	0.2496
					(0.163)	(0.300)	(0.163)	(0.300)
HPD^2						-0.1084		-0.1011
						(0.122)		(0.122)
VRPD					-0.0144	-0.2246***		
					(0.034)	(0.070)		
$VRPD^2$						0.0137***		
						(0.004)		
UVRPD							0.0172	-0.2199*
							(0.066)	(0.128)
$UVRPD^2$								0.0353***
								(0.013)

Product Diversification and Financial Performance [Cont's]

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8
DVRPD							-0.0278	-0.1977**
							(0.042)	(0.082)
$DVRPD^2$								0.0150***
								(0.005)
SIZE	1.0496***	1.0726***	1.0507***	1.0737***	1.0504***	1.0734***	1.0502***	1.0713***
	(0.092)	(0.093)	(0.092)	(0.093)	(0.092)	(0.093)	(0.092)	(0.093)
LIQ	0.0414***	0.0413***	0.0413***	0.0411***	0.0413***	0.0410***	0.0413***	0.0409***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
LEV	-1.5712***	-1.5753***	-1.5703***	-1.5723***	-1.5708***	-1.5727***	-1.5715***	-1.5735***
	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)
PROD	2.9175***	2.9282***	2.9168***	2.9337***	2.9171***	2.9338***	2.9199***	2.9348***
	(0.182)	(0.182)	(0.182)	(0.182)	(0.182)	(0.182)	(0.182)	(0.182)
AGE	0.4596***	0.4713***	0.4575***	0.4701***	0.4565***	0.4655***	0.4552***	0.4646***
	(0.141)	(0.141)	(0.141)	(0.141)	(0.141)	(0.141)	(0.142)	(0.142)
GROW	0.2279*	0.2275*	0.2300*	0.2283*	0.2303*	0.2291*	0.2302*	0.2305*
	(0.130)	(0.130)	(0.131)	(0.131)	(0.131)	(0.131)	(0.131)	(0.131)
INST	-6.5393*	-6.4339*	-6.5553*	-6.5812*	-6.5667*	-6.5748*	-6.5715*	-6.5330*
	(3.668)	(3.667)	(3.670)	(3.670)	(3.670)	(3.670)	(3.671)	(3.668)
Adj R-squared	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
No. observation	12357	12357	12357	12357	12357	12357	12357	12357
F statistics	13.840	13.707	13.696	13.460	13.520	13.105	13.397	12.838

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.4: Robustness Checks: Potential Cubic Relationship

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
PD	-0.2008**			
	(0.088)			
PD^2	0.0079			
	(0.007)			
PD^3	-0.0001			
	(0.000)			
UPD		-0.0455	-0.0367	-0.0367
		(0.122)	(0.122)	(0.122)
UPD^2		-0.0097	-0.0106	-0.0088
		(0.017)	(0.017)	(0.017)
UPD^3		0.0003	0.0004	0.0003
		(0.001)	(0.001)	(0.001)
RPD		-0.3032***		
		(0.111)		
RPD^2		0.0273**		
		(0.013)		
RPD^3		-0.0005		
		(0.000)		
HRPD			1.2690**	1.2455**
			(0.543)	(0.544)
$HRPD^2$			-1.0912**	-1.0677**
			(0.433)	(0.434)
$HRPD^3$			0.1780**	0.1753**
			(0.069)	(0.069)
VRPD			-0.3413***	
			(0.113)	
$VRPD^2$			0.0327**	
			(0.014)	
$VRPD^3$			-0.0006	
			(0.000)	
UVRPD				-0.2814
				(0.187)
$UVRPD^2$				0.0569
				(0.041)
$UVRPD^3$				-0.0013
				(0.002)
DVRPD				-0.2101*
				(0.127)
$DVRPD^2$				0.0176
				(0.019)
$DVRPD^3$				-0.0001
				(0.001)
SIZE	1.0737***	1.0753***	1.0756***	1.0718***

Robustness Checks: Potential Cubic Relationship [Cont's]

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
	(0.093)	(0.093)	(0.093)	(0.093)
LIQ	0.0413***	0.0410***	0.0408***	0.0408***
	(0.010)	(0.010)	(0.010)	(0.010)
LEV	-1.5759***	-1.5733***	-1.5767***	-1.5767***
	(0.077)	(0.077)	(0.077)	(0.077)
PROD	2.9291***	2.9365***	2.9370***	2.9356***
	(0.182)	(0.182)	(0.182)	(0.182)
AGE	0.4712***	0.4700***	0.4684***	0.4677***
	(0.141)	(0.141)	(0.141)	(0.142)
GROW	0.2277*	0.2286*	0.2297*	0.2305*
	(0.131)	(0.131)	(0.130)	(0.131)
INST	-6.4230*	-6.6302*	-6.6540*	-6.5708*
	(3.667)	(3.675)	(3.674)	(3.671)
Adj R-squared	0.14	0.14	0.14	0.14
No. observation	12357	12357	12357	12357
F statistics	13.537	13.140	12.666	12.282

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.5: Robustness Checks: 25.01 or 10.01 per cent as the Ownership Threshold

	(1) Model 1 25.01 per cent	(2) Model 2 25.01 per cent	(3) Model 3 25.01 per cent	(4) Model 4 25.01 per cent	(5) Model 5 10.01 per cent	(6) Model 6 10.01 per cent	(7) Model 7 10.01 per cent	(8) Model 8 10.01 per cent
UPD	-0.0831**	-0.0457	-0.0394	-0.0398	-0.0715*	-0.0721	-0.0658	-0.0663
	(0.038)	(0.078)	(0.078)	(0.078)	(0.038)	(0.076)	(0.076)	(0.076)
UPD^2		-0.0035	-0.0036	-0.0033		-0.0007	-0.0008	-0.0005
		(0.004)	(0.004)	(0.004)		(0.004)	(0.004)	(0.004)
RPD	-0.0190	-0.2283***			-0.0226	-0.2201***		
	(0.031)	(0.065)			(0.031)	(0.065)		
RPD^2		0.0132***				0.0125***		
		(0.003)				(0.003)		
HRPD			0.3909	0.3872			0.4624	0.4594
			(0.318)	(0.318)			(0.318)	(0.317)
$HRPD^2$			-0.1625	-0.1574			-0.1922	-0.1874
			(0.152)	(0.152)			(0.151)	(0.151)
VRPD			-0.2512***				-0.2450***	
			(0.067)				(0.067)	
$VRPD^2$			0.0149***				0.0143***	
			(0.003)				(0.003)	
UVRPD				-0.2520**				-0.2822**
				(0.124)				(0.122)
$UVRPD^2$				0.0363***				0.0381***
				(0.012)				(0.012)
DVRPD				-0.2221***				-0.2036***
				(0.079)				(0.078)
$DVRPD^2$				0.0169***				0.0155***
				(0.005)				(0.005)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Adj R-squared	0.13	0.14	0.14	0.14	0.13	0.13	0.13	0.13
No. observation	13086	13086	13086	13086	13421	13421	13421	13421
F statistics	14.248	14.009	13.658	13.372	14.341	14.084	13.740	13.452

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.6: Robustness Checks: Alternative Performance Measures

	(1) Model 1 ROS	(2) Model 2 ROS	(3) Model 3 ROS	(4) Model 4 ROS	(5) Model 5 ROCE	(6) Model 6 ROCE	(7) Model 7 ROCE	(8) Model 8 ROCE
UPD	-0.0003	-0.0011	-0.0011	-0.0010	-0.0022**	-0.0039**	-0.0040**	-0.0040**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
UPD^2		0.0001	0.0001	0.0001		0.0001	0.0001	0.0001
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
RPD	0.0005	-0.0008			-0.0002	-0.0034**		
	(0.000)	(0.001)			(0.001)	(0.002)		
RPD^2		0.0001**				0.0002***		
		(0.000)				(0.000)		
HRPD			0.0039	0.0038			-0.0053	-0.0055
			(0.004)	(0.004)			(0.008)	(0.008)
$HRPD^2$			-0.0023	-0.0022			0.0004	0.0006
			(0.002)	(0.002)			(0.003)	(0.003)
VRPD			-0.0008				-0.0031*	
			(0.001)				(0.002)	
$VRPD^2$			0.0001**				0.0002**	
			(0.000)				(0.000)	
UVRPD				0.0008				-0.0039
				(0.002)				(0.003)
$UVRPD^2$				0.0002				0.0007**
				(0.000)				(0.000)
DVRPD				-0.0013				-0.0030
				(0.001)				(0.002)
$DVRPD^2$				0.0001*				0.0002*
				(0.000)				(0.000)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Adj R-squared	0.09	0.09	0.09	0.09	0.07	0.07	0.07	0.07
No. observation	12099	12099	12099	12099	10972	10972	10972	10972
F statistics	13.640	13.455	13.118	12.768	6.601	6.531	6.351	6.305

Notes: All models control for country, industry and time fixed effects. Models 1-4 use ROS (return on sales) as the dependent variables. Models 5-8 use ROCE (return on capital employed) as the dependent variables. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.7: Robustness Checks: Sectoral Analysis

	(1) Model 1 High-tech sectors	(2) Model 2 High-tech sectors	(3) Model 3 High-tech sectors	(4) Model 4 High-tech sectors	(5) Model 5 Low-tech sectors	(6) Model 6 Low-tech sectors	(7) Model 7 Low-tech sectors	(8) Model 8 Low-tech sectors
UPD	-0.1645	-0.0408	-0.0287	-0.0819	-0.0804*	-0.1142	-0.1085	-0.1067
	(0.117)	(0.260)	(0.261)	(0.257)	(0.042)	(0.082)	(0.082)	(0.082)
UPD^2		-0.0086	-0.0085	-0.0059		0.0018	0.0017	0.0019
		(0.013)	(0.013)	(0.013)		(0.005)	(0.005)	(0.005)
RPD	0.0021	-0.1727			-0.0224	-0.1962***		
	(0.103)	(0.235)			(0.032)	(0.067)		
RPD^2		0.0102				0.0110***		
		(0.011)				(0.003)		
HRPD			4.0842*	4.1384**			0.3365	0.3371
			(2.116)	(2.077)			(0.292)	(0.292)
$HRPD^2$			-2.8743*	-2.8987**			-0.1038	-0.0989
			(1.483)	(1.435)			(0.114)	(0.113)
VRPD			-0.2191				-0.2077***	
			(0.234)				(0.069)	
$VRPD^2$			0.0130				0.0117***	
			(0.011)				(0.004)	
UVRPD				-0.8625**				-0.0642
				(0.385)				(0.126)
$UVRPD^2$				0.0830***				0.0178
				(0.032)				(0.014)
DVRPD				0.1252				-0.2462***
				(0.270)				(0.082)
$DVRPD^2$				0.0001				0.0158***
				(0.016)				(0.006)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Adj R-squared	0.20	0.20	0.20	0.20	0.13	0.13	0.13	0.13
No. observation	2115	2115	2115	2115	10177	10177	10177	10177
F statistics	9.405	8.914	8.576	8.274	14.254	13.870	13.394	13.001

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.8: Robustness Checks: Source Country Analysis

	(1) Model 1 Emerging economies	(2) Model 2 Emerging economies	(3) Model 3 Emerging economies	(4) Model 4 Emerging economies	(5) Model 5 Developed economies	(6) Model 6 Developed economies	(7) Model 7 Developed economies	(8) Model 8 Developed economies
UPD	-0.2448***	-0.1248	-0.0974	-0.1022	-0.0535	-0.0856	-0.0821	-0.0809
	(0.095)	(0.201)	(0.200)	(0.200)	(0.045)	(0.089)	(0.089)	(0.089)
UPD^2		-0.0090	-0.0104	-0.0099		0.0016	0.0015	0.0018
		(0.013)	(0.013)	(0.013)		(0.005)	(0.005)	(0.005)
RPD	-0.0820	-0.0907			-0.0275	-0.2213***		
	(0.084)	(0.190)			(0.035)	(0.073)		
RPD^2		0.0002				0.0122***		
		(0.010)				(0.004)		
HRPD			2.0027**	1.9887**			0.0798	0.0718
			(0.979)	(0.984)			(0.316)	(0.315)
$HRPD^2$			-0.9622**	-0.9542**			-0.0654	-0.0580
			(0.467)	(0.476)			(0.123)	(0.123)
VRPD			-0.1354				-0.2351***	
			(0.186)				(0.076)	
$VRPD^2$			0.0019				0.0135***	
			(0.010)				(0.004)	
UVRPD				-0.3323				-0.1744
				(0.259)				(0.142)
$UVRPD^2$				0.0268				0.0323**
				(0.030)				(0.014)
DVRPD				-0.0766				-0.2333***
				(0.222)				(0.090)
$DVRPD^2$				0.0001				0.0155***
				(0.017)				(0.006)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Adj R-squared	0.19	0.19	0.19	0.19	0.14	0.14	0.14	0.14
No. observation	1569	1569	1569	1569	10778	10778	10778	10778
F statistics	5.889	5.676	5.497	5.306	14.293	13.187	12.908	12.404

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.9: Robustness Checks: Manufacturing Firm's Size

	(1) Model 1 Large firms	(2) Model 2 Large firms	(3) Model 3 Large firms	(4) Model 4 Large firms	(5) Model 5 Small firms	(6) Model 6 Small firms	(7) Model 7 Small firms	(8) Model 8 Small firms
UPD	-0.0443	-0.0996	-0.0988	-0.0938	-0.1135*	0.0108	0.0159	0.0174
	(0.040)	(0.092)	(0.092)	(0.091)	(0.059)	(0.105)	(0.105)	(0.105)
UPD^2		0.0037	0.0037	0.0034		-0.0127*	-0.0128*	-0.0126*
		(0.005)	(0.005)	(0.005)		(0.007)	(0.007)	(0.007)
RPD	0.0614*	-0.0670			-0.0708	-0.2054**		
	(0.036)	(0.090)			(0.043)	(0.084)		
RPD^2		0.0064*				0.0101**		
		(0.004)				(0.005)		
HRPD			0.1551	0.1484			0.3331	0.3213
			(0.381)	(0.380)			(0.452)	(0.449)
$HRPD^2$			-0.0074	-0.0051			-0.1931	-0.1829
			(0.095)	(0.094)			(0.240)	(0.237)
VRPD			-0.0667				-0.2226**	
			(0.094)				(0.087)	
$VRPD^2$			0.0064				0.0115**	
			(0.004)				(0.005)	
UVRPD				-0.1755				-0.2628
				(0.143)				(0.178)
$UVRPD^2$				0.0251**				0.0488**
				(0.013)				(0.023)
DVRPD				-0.0570				-0.2016*
				(0.112)				(0.104)
$DVRPD^2$				0.0092				0.0101
				(0.006)				(0.008)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Adj R-squared	0.21	0.21	0.21	0.21	0.15	0.15	0.15	0.15
No. observation	1905	1905	1905	1905	10433	10433	10433	10433
F statistics	13.513	13.072	12.639	12.010	12.441	12.259	11.919	11.704

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.10: Robustness Checks: Manufacturing Firm's Age

	(1) Model 1 Old firms	(2) Model 2 Old firms	(3) Model 3 Old firms	(4) Model 4 Old firms	(5) Model 5 Young firms	(6) Model 6 Young firms	(7) Model 7 Young firms	(8) Model 8 Young firms
UPD	-0.0484	-0.0175	-0.0118	-0.0092	-0.0670	-0.0728	-0.0687	-0.0733
	(0.054)	(0.107)	(0.106)	(0.106)	(0.057)	(0.114)	(0.114)	(0.114)
UPD^2		-0.0029	-0.0030	-0.0031		-0.0004	-0.0005	0.0004
		(0.006)	(0.006)	(0.006)		(0.006)	(0.006)	(0.006)
RPD	-0.0268	-0.1543**			0.0113	-0.2149**		
	(0.039)	(0.077)			(0.048)	(0.100)		
RPD^2		0.0076*				0.0148***		
		(0.004)				(0.005)		
HRPD			0.1668	0.1755			0.2030	0.1946
			(0.441)	(0.440)			(0.415)	(0.416)
$HRPD^2$			-0.1375	-0.1389			-0.0634	-0.0468
			(0.201)	(0.201)			(0.150)	(0.151)
VRPD			-0.1555**				-0.2370**	
			(0.079)				(0.103)	
$VRPD^2$			0.0081*				0.0166***	
			(0.005)				(0.005)	
UVRPD				-0.0992				-0.2629
				(0.143)				(0.186)
$UVRPD^2$				0.0116				0.0512***
				(0.014)				(0.020)
DVRPD				-0.1850*				-0.1617
				(0.102)				(0.117)
$DVRPD^2$				0.0132				0.0136*
				(0.008)				(0.007)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Adj R-squared	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15
No. observation	4474	4474	4474	4474	7872	7872	7872	7872
F statistics	7.794	7.627	7.347	7.096	10.070	9.858	9.601	9.437

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 3.11: Summary of 61 Empirical Studies (Product Diversification-Performance Literature)

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
1	(Rumelt, 1982)	273 US firms. Time periods in 1949-1974. Compustat	ROIC (return on invested capital)	Rumelt	Not specified	Positive, inverted U-shape
2	(Hoskisson, 1987)	62 firms over 21 years	ROA	Rumelt	Analysis of covariance: Size (sales), asset growth, GNP growth	Vertical: negative. Related: positive but not significant (p=0.1228). Unrelated: positive
3	(Varadarajan and Ramanujam, 1987)	223 US firms from Directory of Corporate Affiliations, Forbes 36th Annual Report on American Industry	ROE, ROC, sales growth rate, earnings-per-share growth rate.	PD: BSD (number of segments (2-digit)) of parent and their subsidiaries, MNSD (number of segments (2-digit) divided by number of segments (4-digit)). Use sample mean to set up high/low splits	ANOVA. Control variables: Not specified	RPD vs. UPD: related diversifiers outperform unrelated diversifiers.
4	(Grant et al., 1988)	304 UK firms. Time period is 1972-1984. EXSTAT	ROA	Rumelt, Herfindahl	Multiple regression, Hierarchical regression: Size (sales), leverage (total debt/shareholders' fund)	PD: Not significant, inverted U-shape. Rumelt's categories: not significant.
5	(Wernerfelt and Montgomery, 1988)	Formula derivation	Tobin's q	Concentric index of Richard Caves (1980). The index captures the degree of relatedness between industries	Not specified	Inverted U-shape
6	(Lang and Stulz, 1994)	US firms. Time period is 1978-. Compustat	Tobin's q	Number of segments, Herfindahl from sales, Herfindahl from assets	Not specified	Negative

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
7	(Markides, 1995)	200 firms from Fortune 500 list in 1985. Compustat, TRINET	ROS, firm's ROS minus its industry-weighted ROS	Decrease in entropy measure; Decrease in number of segments; Change in Rumelt's categories; Divested at minimum 10% of their asset base	Regression: WXAD (firm's industry-weighted industry advertising intensity), WXRD (firm's industry-weighted industry R&D intensity), WC4 (firm's industry-weighted industry four-firm concentration ratio), DMGMT (equal to 1 if CEO changed during 1981-1986), DSE, Foreign, CAPX, RISK	Negative (refocusing is associated with profitability improvements)
8	(Markides and Williamson, 1996)	97 firms. Compustat, TRINET, questionnaire	ROS	Related (Rumelt way, equal to 1 if the firm is classified as related, equal to 0 if classified as unrelated or dominant)	Regression: Industry sales growth, Media expenditures,	Related diversifiers > unrelated diversifiers (only when they compete across a portfolio of markets in which similar types of accumulated assets are vital)
9	(Tallman and Li, 1996)	192 large US manufacturing MNEs. Directory	ROS	Herfindahl from sales	Size (sales), leverage (long term debt to total capital (debt plus equity)), industry dummies	Inverted U-shape
10	(Qian, 1997)	169 largest US industrial firms from 1981 to 1990	ROA, ROE	Entropy measure based on sales. Related ratio: sales from largest group of related business divided by total sales. Specialisation ratio: sales from largest group of related business divided by total sales	T-test. Control variables: Not specified	PD: not significant. RPD vs. UPD: High related diversification and low unrelated diversification outperform other types of diversification. Relatedness ratio: Firms with high relatedness ratio outperform firms with medium and low relatedness ratio

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
11	(Chang and Hong, 2000)	12019 observations of 1248 firms associated with 317 business groups as of 1996. KIS (Korea Information Service)	ROIC (return on invested capital)	Entropy measure, Unrelated diversification (entropy measure of unrelated diversification at the group level between two-digit KSIC industry groups); Related diversified (within two-digit KSIC industry groups)	Various diagnostic tests for multicollinearity, including the Belsley, Kuh, and Welsch diagnostic (Johnston, 1984), revealed no evidence of multicollinearity: Advertising intensity (Advertising expenditure/ sales), R&D intensity (R&D expenditure/ sales), liquidity (current assets/ current liabilities), leverage, firm size (assets), and internal business transaction.	Positive for related and unrelated diversification
12	(Geringer et al., 2000)	Japanese firms. Time periods in 1977-1993. Analyst's Guide	ROS, sales growth	Herfindahl from sales	Multiple regression model: Size (employees), leverage (debt over assets), industry dummies	Inverted U-shape
13	(Khanna and Palepu, 2000)	1309 Indian firms. Time period is 1993-. Centre for Monitoring the Indian Economy (CMIE)	Tobin's Q, ROA	The number of segments (and its squared term), Herfindahl from sales, Entropy from sales, Concentric measure.	Multivariate regression analysis (using Tobin's Q and ROA)	U-shaped relationship
14	(Palich et al., 2000)	55 studies		Herfindahl, Entropy, number of segments, Rumelt	Meta-analysis	Inverted U-shape
15	(Rajan et al., 2000)	13947 observations of US firms, Time period is 1973-1993. Compustat	Excess Value	standard deviation of segment asset-weighted q's for the firm divided by the equally weighted average q of segments in the firm		Negative. Maybe inverted U-shape
16	(Delios and Beamish, 2001)	399 firms. Analyst's Guide	ROE, ROA, ROS	Entropy from sales	Partial Least Squares (PLS): Leverage, Industry growth, Industry concentration	Not significant
17	(Aleson and Escuer, 2002)	412 observations of 103 non-financial Spanish firms. Time period is 1991-1995. Annual Audit Reports, DNUS Directories	Tobin's q	Varadarajan's (1986) Categories. Broad Specturm Diversity (BSD), Mean Narrow SpecturmDiversity (MNSD). LD, HD, RD,URD	One-way ANOVA	Inverted U-shape relationship

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
18	(Qian, 2002)	71 emerging MNEs. Hoover's Handbook of Emerging Companies	ROS	Entropy from sales	OLS: Size (sales), Firm age, R&D (R&D expenditure/sales), Advertising intensity (advertising expenditure/ sales)	PD: Positive, inverted U-shape
19	(Mayer and Whittington, 2003)	359 firms in France, Germany, UK. Time periods is 1982-1984 and 1992-1994	ROA	Rumelt	Size (assets), leverage (debt/equity), industry dummies, ownership.	Related-constrained PD: Positive. Related-linked PD: Not significant. Unrelated PD: Positive in France
20	(Best et al., 2004)	33357 observations. Time period is 1987-1998. Compustat	Excess value	Dummy (more than one segment)	Size (assets), ROS, leverage (debt to assets), Dividend dummy (equal to 1 if the firm pays a dividend), Institutional ownership	Negative
21	(Lu and Beamish, 2004)	1489 Japanese firms. Time period is 1986-1997. Nikkei NEEDS tapes, Analysts' Guide, Japan Company Handbook	ROA, Tobin's q	Herfindahl from sales	GLS: Exchange rates (US dollar-yen exchange rate), R&D intensity (R&D expenditure/sales), Advertising intensity (advertising expenditure/ sales), Size (net sales), Debt-to-equity ratio, Export intensity (export sales/sales).	PD: Negative
22	(Nachum, 2004)	345 firms, Time period is 1997. World global scope	ROS	Herfindahl from sales, PD=1-sum(S^2i)	Size (sales), Sales growth (average annual growth over the past five years)	PD: linear relationship not tested, inverted U-shape
23	(Piscitello, 2004)	248 largest US, European and Japanese firms (Fortune 500 listing). Reading database	Profit, ROA, sales	Herfindahl from sales		Insignificant relationship with profits and ROA. Positive relationship with sales

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
24	(Tanriverdi and Venkatraman, 2005)	Multibusiness Fortune 1000 firms listed in the year 2000. Survey, Compustat and CRSP	Tobin's Q, ROA, ROE	Entropy measure	Confirmatory factor analytic approach within LISREL 8.3: Human resource relatedness, technological relatedness, firm size (employees), firm risk measures (Beta, Downside risk), performance lag 1 year, Industry performance (three performance measures),	Positive for related diversification if dependent variable is ROA or ROE. Negative for related diversification if dependent variable is Tobin'q.
25	(Miller, 2006)	747 firms. Compustat	Market Value (price of outstanding common shares * number of shares + book value of preferred stock + book value of debt)	Dummy	Weighted least-squares regression, First stage probit regression: Replacement costs, dividend not paid (dummy: equal to 1 is not paid), capital intensity (capital expenditures to total assets), leverage (book value of debt/market value), ROA, R&D intensity (the firm's 1990 R&D expenditures over total assets.)	Positive
26	(Chang, 2007)	115 MNEs in Asia-Pacific, Time period is 1998-2002. Company annual report	ROS	Herfindahl from sales	Cross-sectional heteroskedastic time-wise autoregressive model; multivariate adaptive regression spline (MARS) methodology: Size (employees), R&D (R&D expenditure/sales), leverage (debt over assets)	Inverted U-shape

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
27	(Colpan, 2008)	71 Japanese firms. Time period is 1982-2001. Yuka Shoken Hokokusho	ROS	Rumelt	Pooled time-series cross-sectional regression: Size (employees), leverage (long-term debt to total capital), R&D intensity (R&D expenditure/sales), Advertising intensity (advertising expenditure/sales), capital intensity (assets/employees), industry dummies, year dummies	Related > unrelated
28	(Li and Yue, 2008)	435 MNEs from 13 developed countries, Time period is 1987. Directory of Multinationals	ROA, ROS	Herfindahl from sales	Civil law, size, leverage, industry growth	PD: Not significant, inverted U-shape
29	(Qian et al., 2008)	189 largest US firms (1996-2000)	ROA, ROS	Entropy from sales	Firm size (employees), firm age, R&D intensity, leverage (debt to assets ratio), firm risk (std. dev. of firm profitability (both ROA and ROS)), product scope (entropy), industry effect.	Insignificant positive relationship
30	(Schmid and Walter, 2009)	2060 observations of US firms. Time periods is 1985-2004. Compustat	Excess value	Dummy (more than one segment), Number of segments, Herfindahl	Fixed effects panel regression, IV regression, Heckman selection model: Size (assets), leverage, ROA, S&P500, Past assets growth	Negative

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
31	(David et al., 2010)	14294 observations of 1180 Japanese firms. Time period is 1992-2001. Pacific-Basin Capital Market, Japanese Overseas Investment, Japan Company Handbook, NEEDS	Growth (ln(salest/salest-1)), Employment growth (ln(employeest/employeest-1)), Tobin's q	Entropy measure	Two-stage least squares (2SLS) instrumental variables regression methods: Size (sales), fixed assets/total assets, free cash flow, leverage (total debt/total assets), volatility (standard deviation of return on assets over the previous five years), industry growth, industry profit, and industry volatility were measured as the median value of the corresponding firm-level variable for all firms for which that industry was their primary industry	Negative related to profit
32	(Singh et al., 2010)	3,978 small and medium-sized enterprise German manufacturing firms. Time period is 2004-2006	ROA	Herfindahl from sales	GLS random effects	Inverted U-shaped relationship
33	(Chao et al., 2012)	500 firms in Fortune Global 500 company list on 2004. Fortune Global 500, Hoover's and Mergent Online, Global Competitiveness Report	ROA (three-year average)	Average of BSD and MNSD. BSD (number of segments (2-digit)), MNSD (number of segments (2-digit) divided by number of segments (4-digit)).	Ordinary multiple regressions, hierarchical regressions: Institutional distance, International experience, Size (employees), Leverage (debt-to-equity), Industry profitability (ROA)	Positive linear relationship, inverted U-shaped
34	(Hoechle et al., 2012)	4250 firms. Time period is 1996-2005. Compustat	Excess value	Dummy (Move from one to two segments). Number of segments (results not shown)	Fixed effects regression, Probit regression, Heckman selection model, Dynamic panel GMM model: Size (assets), Capital expenditures/sales, EBIT/sales, sales growth, leverage, CEO ownership, institutional ownership, board size	Negative

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
35	(Banalieva and Dhanaraj, 2013)	625 firms with 3061 observations in 12 Triad countries from 1997 to 2006. OSIRIS (similar version to Orbis), Bloomberg Terminal	ROA, Tobin's Q	Herfindahl	2SLS, 3SLS: Marketing advantage, Home-region orientation (HRO): (regional sales (excluding domestic sales)/ foreign sales), Regional market Attractiveness, Age, Institutional distance, Size (sales), Industry HRO, Firm fixed effects, Year fixed effects	Positive relationship
36	(Kang, 2013)	3,044 observations of 511 US firms. Time period is 1993-2006. Compustat's North America, Compustat's Executive Compensation, Kinder, Lydenberg, Domini (KLD) Social Ratings database	Corporate social performance (sum of all strength items minus sum of concern items)	Entropy from sales, Related PD, Unrelated PD	Moderating variables: Profitability	Positive relationship between unrelated PD and performance; Insignificant negative relationship between related PD and performance
37	(Kistruck et al., 2013)	3616 charities in 1997-2001. Chariries Assessing and Registration (CARE)	Efficiency (amount spent directly on charitable programs by the total expenditures of the organization)	Entropy from expenditure on each activity	IV/two stage least squares (ivreg2): Size (assets), industry dummies, subcontractor monitoring, culture distance, revenue shifting.	Inverted U-shape
38	(Zahavi and Lavie, 2013)	156 US software firms. Time period is 1990-2001. Compustat-CRSP, Lexis-Nexis, Thompson's Dialog New Product Announcements	Sales growth (measured using a logarithmic power function)	Herfindahl from the number of products introduced in each segment. Concentric diversity	Moderating variables: Technology intensity (R&D intensity) Intra-industry product diversification experience	U-shaped relationship
39	(Galvn et al., 2014)	609 firms from 10 Eurozone countries. Time period is 1993-2000	Excess value	Entropy from sales, Herfindahl from sales	IV: Moderating variables: Relatedness dummy (1 if not sharing two-digit code)	Inverted U-shaped relationship; Related PD is value-creating than unrelated PD; Unrelated PD is likely to be value-destroying at lower levels than related PD

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
40	(O'Brien et al., 2014)	11,759 observations of Japanese firms. Time period is 1991-2001. Pacific-Basin Capital Markets (PACAP) Database, Japanese Overseas Investments, Japan Company Handbook, NIKKEI NEEDS	market-to-book ratio	Entropy from sales	Moderating variables: Leverage, Bond debt, Bank debt	Negative relationship
41	(Qiu, 2014)	485 observations of firms in 17 countries. Time period is 2006-2009. Compustat Hofstede's national index, KOF (Swiss Economic Research Institute) index of globalization, IMF eLibrary Data	Tobin's Q	Herfindahl from sales	Multilevel (hierarchical linear modeling), IV/2SLS (IV regression)	Positive relationship
42	(Yang et al., 2014)	1233 observations of 189 US listed firms. Time period is 1990-2004	Tobin's Q	Herfindahl from sales	Generalized panel-data linear regression fixed effects models: Industry relatedness (4 if sharing same 4-digit code, 3 if sharing same 3-digit code, and so on; 0 if no overlap), Assets, Capital expenditure, Sales growth, R&D intensity, CVC (Corporate venture capital) age, CVC portfolio size, Industry average Q, Year fixed effect, Moderating variables: Available slack (current ratios), Potential slack (debt-to-equity ratio),	U shaped relationship

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
43	(Benito-Osorio et al., 2015)	17387 observations of Spanish firms. Time period is 1994-2008. Survey on Business Strategies	ROA, ROS	Entropy measure	Panel regression with fixed effects: Sales growth, Age, Size (employees), Advertising intensity (advertising expenditure/sales), R&D intensity (R&D expenditure/sales), work productivity (value added/employees), market listing, industry dummies, year dummies.	Inverted U-shape
44	(de la Fuente and Velasco, 2015)	437 observations of 437 Spanish firms. Time period is 1997-2012. Worldscope, Datastream	Excess equity sales: (market value common equity - book value common equity)/sales	Diversification dummy, The number of segment, Herfindahl from sales	Moderating variables: Crisis	Positive relationship between the number of segment and excess equity sales
45	(Hashai, 2015)	896 observations of 147 high-tech Israel firms. Time period is 2000-2007. Dolev and Abramovitz, Ltd. (D&A) dataset	ROS	The number of segments (within industry diversification)	IV/2SLS (IV regression)	S-shaped relationship
46	(Kuppuswamy and Villalonga, 2015)	15303 observations of 4370 firms. Compustat	Excess value	Diversified (Dummy), Unrelated diversified (reported two or more business segments in different two-digit SIC codes); Related diversified (all the others)	OLS regression: the ratio of cash and marketable securities relative to the book value of assets; leverage (measured as total debt (short-term plus long-term) relative to the book value of assets); dividend paid (dummy indicating whether the firm paid dividends); cash flow volatility (measured as the standard deviation of the ratio of operating income after depreciation to assets over the four quarters ending in 2007Q2); CAPEX/sales; operating income after depreciation/ sales; log of total assets	Positive during financial crisis. Unrelated > related

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
47	(Su and Tsang, 2015)	2,364 observations of 391 US firms (Fortune 500 list). Time period is 1996-2003. Compustat, RiskMetrics, Taft Corporate Giving Directory,	ROA	Entropy from sales, Total PD, Related PD, Unrelated PD	Moderating variables: Secondary stakeholders	Negative relationship. Secondary stakeholders positively moderate this DP-P relationship
48	(Andreou et al., 2016)	25,996 observations of 5,680 firms. Time period is 1998-2008. Compustat Industrial Segment, Compustat Industrial Annual databases	Excess value	Dummy (more than one segment)	Pooled OLS regression: Control variables: EBIT/sales (1 and 2 lag), Investments (Capital expenditure/sales, 1 and 2 lag), Size (assets, 1 and 2 lag), Leverage (long-term debt to assets), Size-squared (assets- squared)	Negative. Single-business firms who diversify once experience value reduction. Multi-business firms who diversify once don not experience value reduction.
49	(De Beule and Sels, 2016)	147 Indian firms in Europe. Time period is 1996-2010. Zephyr, Prowess, Center for Monitoring the Indian Economy (CMIE),	CARs	Diversification dummy	Event study methodology	Positive relationship
50	(Delbufalo et al., 2016)	581 observations of Italian manufacturing firms. Time period is January 2005 December 2011. Companies' reports	ROA	Entropy from sales	Fixed effects panel regression	Insignificant inverted U-shaped relationship
51	(Doumpos et al., 2016)	8051 observations of 1204 commercial banks in 111 countries. Time period is 2001-2010. OSIRIS	Overall financial strength indicator (OFSI)	Herfindahl measure (Income Diversification, Earning Assets Diversification, Balance Sheet Diversification)	Fixed effects regression	Positive relationship
52	(Sajid et al., 2016)	141 non-financial Pakistani listed firms. Time period is 2003-2013. Companies' reports	ROA	Herfindahl from sales	GLS panel regression	Insignificant inverted U-shaped relationship
53	(Wang et al., 2016)	Top 100 manufacturing Taiwan firms. Common Wealth Magazine in 2014	DEA (dynamic data envelopment analysis) efficiency scores	Herfindahl from sales, Entropy from sales	Dynamic data envelopment analysis model, OLS regression	Positive relationship

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
54	(Santarelli and Tran, 2016)	236,601 observations of 26,289 non-agricultural Vietnamese firms. Time period is 2002-2010. Annual enterprise survey, Database conducted by the GSO	ROS, sales growth	Diversification dummy, Entropy from sales	Heckman two-step, GMM	Inverted U-shaped relationship
55	(Brahm et al., 2017)	530 trucks of Chile's largest logistical operator Transportes Compaa Cerveceras, Unidas (TCCU). Time period is January 2011 December 2012	Productivity (delivered volume: the number of equivalent boxes delivered)	Herfindahl from percentage of cargo delivered by each truck in each of the product categories, Concentric diversification index	Multiple regression	Inverted U-shaped relationship
56	(de Andrs et al., 2017)	US firms from 1998 to 2014. Worldscope, Datastream, US Census Bureau	Growth option value (Market-to-book assets ratio)	PD: Number of segments (4 and 2 digit SIC); Herfindahl (4 and 2 digit SIC); Entropy Related PD: Related entropy; Relative related entropy (ratio of related entropy to total entropy); Unrelated entropy	GMM: Size, Leverage, Age	U-shaped relationship. Relatedness: inverted U-shaped relationship
57	(Eckardt and Skaggs, 2017)	137 accounting firms and 125 law firms. Time period is 2004-2010. Accounting Today's annual survey, American Lawyer's Top 200 Law Firm report	Sales growth, Use of mergers and acquisitions			Negative relationship with sales growth Positive relationship with the use of mergers and acquisitions
58	(Gyan, 2017)	317 Malaysian listed firms. Time period is 2009-2014. World scope	Tobin's Q, ROA	Diversification dummy	Moderating variables: Productivity	Negative relationship with ROA
59	(Lahiri and Purkayastha, 2017)	263 business group-affiliated Indian firms. Time period is 2004-2008. Prowess, Center for Monitoring the Indian Economy (CMIE), Capitaline database	ROA	Entropy from sales, Total PD, Related PD, Unrelated PD	Moderating variables: Business group diversity, Business group size, Domestic ownership, Foreign ownership, Manufacturing vs. service	Negative relationship

Summary of 61 Empirical Studies (Product Diversification-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measure of Product Diversification**	**Explanatory Variables**	**Findings**
60	(Mendoza-Abarca and Gras, 2017)	3,860 Canadian new nonprofits (NPO). Time period is 2003-2013. Charities Directorate, T3010 tax form	Nonprofit efficiency (money spent specifically on charitable programs by total money it spent), Organisational survival (do not fail within the window of observations)	Entropy from resource	Moderating variables: Revenue diversification	Negative relationship
61	(Ramaswamy et al., 2017)	5472 affiliated firms of 364 Italian business groups. Time period if 1988-2012. Prowess	Excess ROA	Entropy from sales	Panel data regressions (fixed effects): Size, Age, Leverage, Investment intensity (net fixed assets/sales), R&D intensity, Multinationality (FSTS), Moderating variables: Institutional development index	Positive relationship

Notes: ROC refers return on total capital. BSD refers to broad spectrum diversification. MNSD refers to mean narrow spectrum diversification. CARs refer to Cumulative abnormal returns.

Table 3.12: Key Issues in Product Diversification Strategy Literature

Issue	**Main alternatives**	**Recommendations**
Unit of analysis	Firm-level, Industry-level	Firm-level
Motivations of diversification	synergy effects, market power advantage, internal market efficiency, portfolio effects	Incorporate important motives in empirical model
Measures of performance	Accounting performance (ROA, ROE, ROS, EBITOA, Sales growth, Employment growth, EPS growth rate), Market performance (Tobin's Q, excess value)	ROA
Measures of firm diversification	Number of Segments, Herfindahl based on sales, Entropy based on sales, imputed weighted diversification measure, Rumelt, Multi-segment dummy, Varadarajan's (1986) Categories (BSD, MNSD)	Number of Segments
Estimation method	OLS, OLS FE/RE (Fixed effects panel regression), IV/2SLS (IV regression), 3SLS, PLS, GLS , ANOVA, T-test, Hierarchical regressions, Weighted least-squares regression, First stage probit regression, Cross-sectional heteroskedastic time-wise autoregressive model; MARS, GMM, Heckman selection, Dynamic panel GMM, Confirmatory factor analytic approach within LISREL 8.3	Depends on data availability, OLS
Functional form	Linear, Curvilinear	Curvilinear
Time lags	Concurrent measures of diversification and performance	Discuss the possible lags

Key Issues in Product Diversification Strategy Literature [Cont's]

Issue	**Main alternatives**	**Recommendations**
Control variables	Firm-level: Size (employees or sales), Assets growth, Leverage (debt-to-equity), R&D intensity, Advertising intensity, Age, Labour productivity, CAPX (capital investment), Replacement costs, Capital intensity (capital expenditures to total assets; assets/employees), RISK (standard deviation of prior 5-year ROS), Volatility (standard deviation of ROA over the prior five years), DMGMT (equal to 1 if CEO changed during 1981-1986), Liquidity (current assets/ current liabilities), Dividend dummy (equal to 1 if the firm pays a dividend), S&P500 (a dummy equal to one if the firm belongs to S&P500 index), Past assets growth (past assets growth over prior three years), EBIT/sales, CEO ownership, Board size, Institutional ownership, Exchange rates (US dollar-yen exchange rate), Civil law, Export intensity, Performance lag, Cash flow, Market listing, Operating income after depreciation, Firm fixed effect, International experience, Marketing advantage, Home-region orientation (HRO): (regional sales (excluding domestic sales)/ foreign sales), Industry HRO, Regional market Attractiveness, Industry-level: Industry sales growth, Industry advertising intensity, Industry R&D intensity, Industry concentration, WC4 (firm's industry-weighted industry four-firm concentration ratio), Industry performance (three performance measures), Industry profitability (ROA), , Industry fixed effect, Country-level: Country fixed effect, GDP growth, Dyadic-level: Institutional distance, Culture distance, Year-level: Year fixed effect	Size, Leverage, Sales per worker, GDP growth, GDP per capita, Institution
Moderating variables	Available slack (current ratios), Potential slack (debt-to-equity ratio), Leverage, Bond debt, Bank debt, Revenue diversification, Secondary stakeholders, Technology intensity (R&D intensity), Intra-industry product diversification experience, Institutional development index, Business group diversity, Business group size, Domestic ownership, Foreign ownership, Manufacturing vs. service, Productivity , Relatedness dummy (1 if not sharing two-digit code	Relatedness

Notes: EPS refers to earnings-per-share. MARS refers to multivariate adaptive regression spline methodology.

Table 3.13: List of Countries and Key Variables

Country	N	ROA	PD	UPD	RPD	HRPD	VRPD	UVRPD	DVRPD
Argentina	3	5.87	4.00	2.00	2.00	0.00	2.00	0.33	1.67
Australia	44	-3.43	8.14	3.86	4.27	0.18	4.09	1.39	2.70
Austria	215	5.98	6.22	2.31	3.91	0.27	3.64	0.91	2.73
Belgium	577	2.89	6.00	2.25	3.74	0.27	3.47	1.03	2.44
Bermuda	184	-2.81	8.22	3.59	4.63	0.17	4.45	0.86	3.59
Bosnia and H.	29	4.64	3.14	1.10	2.03	0.10	1.93	0.55	1.38
Brazil	34	5.82	6.03	2.47	3.56	0.21	3.35	1.41	1.94
Bulgaria	29	4.27	3.45	0.90	2.55	0.24	2.31	0.66	1.66
Canada	8	-1.27	7.88	3.50	4.38	0.25	4.13	1.25	2.88
Canary Islands	3	-2.38	2.33	0.67	1.67	0.33	1.33	0.00	1.33
Cayman Islands	330	1.47	6.45	3.01	3.45	0.15	3.30	0.64	2.67
Chile	8	4.42	4.13	0.75	3.38	0.63	2.75	1.88	0.88
China	410	4.26	2.98	1.55	1.43	0.11	1.32	0.50	0.82
Colombia	4	4.79	4.00	1.25	2.75	0.25	2.50	1.50	1.00
Croatia	115	3.03	4.97	2.07	2.90	0.33	2.57	1.12	1.45
Cyprus	9	0.25	6.67	3.67	3.00	0.11	2.89	0.33	2.56
Czech Republic	338	5.91	12.51	5.38	7.13	0.33	6.80	1.92	4.88
Denmark	28	4.24	9.96	4.29	5.68	0.36	5.32	1.04	4.29
Egypt	2	2.60	5.50	3.00	2.50	0.00	2.50	1.50	1.00
Estonia	18	3.59	5.83	1.50	4.33	0.22	4.11	0.56	3.56
Finland	366	2.92	5.49	2.29	3.20	0.20	3.00	0.67	2.33
Germany	1076	4.83	5.88	1.91	3.97	0.25	3.73	1.07	2.66
Greece	137	-1.35	5.64	2.14	3.50	0.22	3.28	1.33	1.96
Hong Kong	45	3.02	6.49	3.24	3.24	0.33	2.91	0.96	1.96
Hungary	44	3.50	17.57	8.30	9.27	0.84	8.43	3.75	4.68
India	84	4.30	4.44	2.32	2.12	0.10	2.02	0.63	1.39
Indonesia	14	5.53	3.21	1.57	1.64	0.14	1.50	0.50	1.00
Ireland	74	4.21	4.26	1.76	2.50	0.14	2.36	0.76	1.61
Israel	68	2.24	4.32	1.90	2.43	0.03	2.40	0.53	1.87
Italy	2088	1.40	3.25	1.43	1.82	0.11	1.71	0.38	1.34
Japan	1012	1.90	5.58	2.12	3.45	0.21	3.24	1.29	1.95
Jordan	4	5.50	4.00	1.25	2.75	0.00	2.75	0.25	2.50
Latvia	25	6.65	5.72	1.96	3.76	0.36	3.40	0.52	2.88
Lithuania	23	6.53	6.04	2.30	3.74	0.30	3.43	0.91	2.52
Luxembourg	36	3.75	6.39	2.33	4.06	0.17	3.89	1.03	2.86
Malaysia	6	3.73	4.50	1.17	3.33	0.17	3.17	1.83	1.33
Mexico	5	6.10	4.20	1.80	2.40	0.00	2.40	0.80	1.60
Moldova	6	3.52	4.83	2.00	2.83	0.00	2.83	1.00	1.83
Montenegro	3	-5.09	2.00	1.33	0.67	0.33	0.33	0.00	0.33
Netherlands	214	6.24	7.13	2.38	4.75	0.28	4.47	0.96	3.51
New Zealand	5	1.44	9.00	3.80	5.20	0.20	5.00	1.00	4.00
Nigeria	2	9.46	2.00	1.00	1.00	0.00	1.00	0.00	1.00
Norway	203	4.57	3.87	1.61	2.27	0.19	2.08	0.51	1.57
Pakistan	6	8.52	3.00	1.83	1.17	0.00	1.17	0.50	0.67
Philippines	10	3.78	5.40	3.00	2.40	0.40	2.00	0.70	1.30
Poland	60	1.36	5.98	2.07	3.92	0.23	3.68	0.60	3.08
Portugal	14	3.23	2.57	0.79	1.79	0.21	1.57	0.36	1.21
Romania	3	4.39	2.00	0.33	1.67	0.00	1.67	1.00	0.67

Number of Firms and Key Variables by EMNEs' Home Economy [Cont's]

Country	N	ROA	PD	UPD	RPD	HRPD	VRPD	UVRPD	DVRPD
Russia	7	1.22	5.57	2.86	2.71	0.29	2.43	1.00	1.43
Saudi Arabia	5	5.73	7.60	3.40	4.20	0.20	4.00	1.60	2.40
Serbia	49	5.11	2.59	0.88	1.71	0.06	1.65	0.29	1.37
Singapore	9	7.15	3.67	2.11	1.56	0.11	1.44	0.44	1.00
Slovakia	5	5.61	6.00	3.00	3.00	0.00	3.00	0.00	3.00
South Africa	19	8.76	3.95	1.53	2.42	0.21	2.21	0.63	1.58
Spain	1324	1.21	3.51	1.46	2.05	0.22	1.83	0.56	1.27
Sri Lanka	15	5.04	4.00	2.67	1.33	0.13	1.20	0.60	0.60
Sweden	742	3.80	4.22	1.55	2.67	0.11	2.57	0.61	1.96
Switzerland	71	3.74	10.41	3.85	6.56	0.24	6.32	1.68	4.65
Taiwan	114	2.44	1.53	0.69	0.83	0.11	0.73	0.32	0.40
Turkey	16	4.59	3.19	1.38	1.81	0.19	1.63	0.25	1.38
UK	746	3.91	4.53	1.67	2.87	0.13	2.74	0.75	1.99
US	1209	-0.29	8.57	3.74	4.83	0.22	4.61	1.63	2.98
Ukraine	5	-1.44	5.60	2.20	3.40	0.00	3.40	1.20	2.20

Notes: N is the number of firms. PD refers to total product diversification. UPD refers to unrelated diversification. RPD refers to related diversification. HRPD refers to horizontal related diversification. VRPD refers to vertical related diversification. UVRPD refers to upstream vertical related diversification. DVRPD refers to downstream vertical related diversification. Bosnia and H. refers to Bosnia and Herzegovina.

Chapter 4

Firm Diversification and Financial Performance: Evidence from Manufacturing Firms Worldwide

4.1 Introduction

This paper attempts to link industry and national contexts to the joint effect of product and international diversification on firm performance. The research on how firm performance is affected by diversifying into new product and geographic markets has been an important topic within the of international business and strategy literature for more than 40 years (Bowen and Sleuwaegen, 2017; Castellani et al., 2017). Product and international diversification are vital strategies in organisation expansion (Kistruck et al., 2013). Despite the fact that increasing number of firms have been engaging in the both diversifications, few papers study the interaction between the two diversification strategies and its performance implications. Most previous papers only focus on one type of diversification. Furthermore those studies that do consider the joint effect of the two diversification strategies on firm performance (Sambharya, 1995; Hitt et al., 1997; Geringer et al., 2000; Kistruck et al., 2013) identify either a complementary or a substitute effect between two diversification strategies. They generally ignore, however, the underlying factors that strengthen or weaken the joint effect.

Product and international diversification have two opposing interactive effects, namely complementary and substitute effects, on firm performance. On the one hand, the complementary effect suggests that the sophisticated managerial capabilities developed in managing multiple product divisions can be easily leveraged in multiple geographic markets. On the other hand, the substitute effect contends that resource constraints would require the firm to choose between the two diversification strategies, suggesting a trade-off. Previous empirical papers provide mixed results regarding the interaction effect of two diversification strategies, including not significant, positive or negative effects (Geringer et al., 1989; Sambharya, 1995; Hitt et al., 1997).

We contribute to this debate by examining the joint effect of two diversification strategies. More importantly, we further examine how industry and national contexts shape the relationship between the two diversification strategies and firm

performance, particularly considering the technological capability of the home sector and the economic development of home country.

Our paper makes three contributions. First, recent studies have called for more research on the interactive effect of the two diversification strategies (Bowen and Sleuwaegen, 2017), particularly the relationship between the two diversification strategies and financial performance (Kistruck et al., 2013). We examine the joint effect of the two diversification strategies, instead of their individual effects. We argue that the two diversification strategies tend to be substitutes rather than complements. The firm needs to choose between the two strategies due to resource constraints and accelerating governance costs when simultaneously implementing two strategies. Second, few of the papers that study the joint effect consider the underlying factors that strengthen or weaken the effect. Recent research emphasises the importance of industry and national contexts (Bebenroth and Hemmert, 2015; Mayer et al., 2015) in diversification strategies. We argue and find that the substitute effect is stronger for firms from high-tech sectors, while it is weaker for firms from developed countries. Third, until recently, past studies have mostly relied on U.S. or Japanese firm data to support their findings. We make an empirical contribution by testing our hypotheses using a very large firm-level dataset covering 13142 multinational manufacturing firms from 70 countries over the period of 2004-13.

4.2 Literature Review and Hypotheses Development

Diversification provides benefits. More specifically, product diversification provides firms with synergy effects, market power advantage, internal market efficiency and portfolio effects (Palich et al., 2000). By diversifying into different geographic markets, international diversification helps multinational enterprises (MNEs) access cheaper resources, acquire foreign knowledge, realise economies of scale, obtain internationalisation experience, exploit firm-specific assets in foreign markets and

reduce revenue fluctuations (Castellani and Zanfei, 2007; Contractor, 2007; Buckley and Strange, 2011; Yang and Driffield, 2012).

But diversification does not come without costs. The literature suggests that product diversification may be associated with increased information asymmetries, bureaucratic costs, and cross-subsidization inefficiencies that have a negative impact on firm performance (Palich et al., 2000). Further, international diversification may result in additional costs due to unfamiliarity with foreign markets, enhanced business risks and greater coordination costs (Majocchi and Strange, 2012). Overall, the individual effects of product and international diversification on performance will be determined by the net effects of these benefits and costs (Palich et al., 2000; Contractor, 2007).

4.2.1 The joint effect of product and international diversification on firm performance

Numerous studies have focused on the individual effects of product and international diversification, while the joint effect has attracted much less attention (Geringer et al., 2000; Bowen et al., 2015), and the results are mixed. Some find a positive joint effect (Hitt et al., 1997), some find a negative joint effect (Sambharya, 1995; Kistruck et al., 2013), while some report an insignificant joint effect (Geringer et al., 1989). It is argued that the joint effects of the two diversification strategies are far more complex than previous research about the individual effects (Hitt et al., 1997). Our research model is shown in Figure 3.3.

On the one hand, one may argue the complementary effect between two diversification strategies on firm performance. Some scholars draw on the resource-based view and contend that the proprietary assets that support international diversification seem to be the same that support product diversification. Thus, firms can exploit the same proprietary assets to take advantage new product and market opportunities (Caves, 1996; Matraves and Rodriguez, 2005). It is also argued that product-diversified firms have developed sophisticated managerial capabilities

in dealing with multiple businesses, and these capabilities can be easily leveraged in multiple markets (Hitt et al., 1997). This implicitly assumes that the firms are sequential in making corporate strategies such that they first expand their product scope and then expand their market scope.

However, this assumption needs further investigation. For instance, born global firms enter the global market a very short time after the firm is set up (Bell et al., 2001), which means that increasing market scope but not product scope is the priority of these firms. Also, instead of arguing that the product diversification experience helps geographic expansion, one may argue that the prior product diversification experience actually imposes a real constraint on the firm's ability to expand subsequently into new geographic markets (Wiersema and Bowen, 2008).

A firm's expansion into new products or markets is motivated by the opportunities to leverage its excess resources (Wernerfelt, 1984), according to the resource-based view. However, many necessary resources, particularly managerial capability and attention, may be limited. Thus although firms may pursue both strategies in the long-term, the literature finds that there is a trade-off between product and international diversification in the short-term. Firms' limited resources may thus limit their ability to find and invest in new product and market opportunities (Bowen and Sleuwaegen, 2017). Also, the congestion problem of accessing common resources (e.g. proprietary assets) for multiple applications (Teece, 1980) tends to be more severe when simultaneously exploiting the proprietary assets in new product and geographic markets, thus impeding the realisation of diversification benefits.

On the other hand, some may argue the substitute effect between the two diversification strategies on firm performance. From the agency theory point of view, larger firms are usually associated with higher managerial remuneration (Rosen, 1990), so managers are motivated to increase firm size. Managers may accordingly choose a diversification strategy to build a business empire (Davies et al., 2001). An international diversification strategy can be viewed as an alternative to a product diversification strategy (Denis et al., 2002).

Due to resource constraints, there may thus be a substitute effect between product and international diversification. Both product and geographic expansions require significant investments, and competition for the same stock of resources possessed by firm. Firms that simultaneously try to implement two diversification strategies will face resource constraints (Sambharya, 1995), and may not have enough resources to assure the success in both new product and geographic market at the same time (Kumar, 2009), which will negatively affect the firm performance. Besides, research finds that international diversification reduces the advantages of related diversification since the synergy effects of marketing and production are impeded internationally (Palich et al., 2000; Hashai and Delios, 2012). In addition, prior research finds a negative relationship between product and international diversification in the short-term, mainly due to the limit to the replicability and transferability of tacit knowledge between two corporate strategies (Kumar, 2009).

Simultaneously pursuing high levels of product and international diversification incurs high coordination costs (Tallman and Li, 1996; Bowen et al., 2015). Firms with high levels of product and international diversification will face considerable costs that may outweigh the additional returns from the activities in geographically-diverse markets. Managerial resources may be over-stretched when firms have diversified product portfolios and extensive international operations (Jones and Hill, 1988; Tallman and Li, 1996).

Overall, firms will typically face resource constraints and increasing bureaucratic cost when pursuing simultaneously product and international diversification. Limited resources may impede firms' abilities to pursue both strategies, and there will be a trade-off in allocating the resources among the two strategies, both of which need significant investments. Also, simultaneously pursuing high levels of product and international diversification incurs high governance costs that may exceed the benefits of diversification, and tend to adversely affect firm performance. Therefore, we propose the following hypothesis.

Hypothesis 1: Product diversification and international diversification have a

negative joint effect on firm performance.

4.2.2 High-tech versus low-tech sector context

Most of the previous research that studies the joint effect of the two diversification strategies generally ignores the underlying factors that may moderate the joint effect. Only a few studies (Coad and Rao, 2008; Mayer et al., 2015) consider the industry context, but they do not link it to the joint effect. We suggest that industry context plays an important role in shaping the interactive effect of the two diversification strategies.

The distinction between high-technology and low-technology industries is vital when examining the joint effect of the two strategies on firm performance, in part because the importance of proprietary assets varies across industries with different technological capabilities. First, high-tech firm's competitive advantage largely relies on proprietary assets, particularly technology resources like skilled research workers (Himmelberg and Petersen, 1994). The simultaneous diversification into new product and geographic markets raises the congestion problem of accessing these common resources, thus negatively affecting high-tech firms' performance. In contrast, low-tech firms are less dependent on proprietary assets (Tihanyi et al., 2003). The congestion problem is thus more severe in high-tech firms, compared to low-tech firms.

The resource constraint problem in implementing diversification strategies is also more severe for firms from high-tech sectors than those from low-tech sectors. Due to high R&D expenditures and long payback periods in high-tech sectors, simultaneously diversifying into new product and geographic markets while maintaining current operation requires significant resources with returns only forthcoming in the long-term. High-tech firms may thus experience difficulties in attracting enough investment funds from external financial markets, particularly from institutional investors that focus on short-term returns (Zahra, 1996) and may need to rely on internal finance (Himmelberg and Petersen, 1994). These internal financial resources

may be needed for R&D, but also required to be used in new product or geographic markets if the firm is simultaneously implementing two diversification strategies (Tihanyi et al., 2003). In contrast, the resource constraint problem is less severe in low-tech firms due to their low investments in long-term projects.

In addition, high-tech firms may be concerned that their innovative products are imitated by competitors in some foreign countries with low intellectual property (IP) rights, and may also be concerned about the high IP protection fees required by the patent offices in some developed countries in the US and Europe (Smith, 2002; Love and Ganotakis, 2013). These concerns may limit the choice of overseas countries open to high-tech firms, and inhibit their levels of international diversification. In contrast, those concerns are less important to low-tech firms. Thus, they have a wider range of choices of foreign market and encounter fewer costs in increasing international diversification.

To sum up, high R&D investments are expected in high-tech firms. This raises the potential severity of resource constraints in the simultaneous implementation of the two diversification strategies, as these also require significant investments. Also, the diversification benefits may be offset by various costs such as technology leakage in the foreign country. In contrast, low-tech firms face less severe resource constraints, and gain more from diversifications.

Hypothesis 2: The negative joint effect of product and international diversification is stronger for firms in high-tech sectors rather than low-tech sectors.

4.2.3 Emerging versus developed country context

Apart from the industry context, we also explore the country context. A few papers have highlighted a possible source country effect (Claessens and Van Horen, 2012; Bebenroth and Hemmert, 2015), but they have not considered the joint effect of the two strategies on firm performance. We suggest that the source country plays a vital role in the interaction effect of the two diversification strategies.

We distinguish between firms from developed countries and firms from emerging

countries. The resource endowments of firms in emerging countries, in terms of managerial skills, financial resources and intangible assets (e.g. brand and legitimacy), are quite different from their developed country counterparts. Furthermore, emerging country firms are looking to catch up technologically with the developed country MNEs and become leading players in their respective industries (Mathews, 2006). These differences have important ramifications for their abilities to diversify.

First, emerging country firms' limited managerial skills and attention do not allow them to diversify their business and geographic market at the same time. Many emerging country firms are newly privatised state-owned firms. The managerial practices and centralised management style that proved effective in a command economy context, are no longer successful in the market-oriented global economy (Shama, 1993; Hitt et al., 2000). In contrast, developed country MNEs have sophisticated management systems, combined with important features of their home country institutional environments such as education system and regulation, leading to their enhanced competitive advantage in global markets (Bebenroth and Hemmert, 2015).

Second, emerging country MNEs lack financial resources, and this reduces their ability to simultaneously carry out both diversification strategies. The low levels of economic development and the weak institutional environments impede capital distribution in emerging countries (Hitt et al., 2000), so that capital is less available and more expensive (Svetličič and Rojec, 1994). In contrast, developed country firms have relatively more financial resources to support different dimensions of firm diversification (Li and Qian, 2005), notwithstanding the reality that firms are constantly struggling to balance the resource allocations on different product and geographic markets.

Third, emerging country MNEs are often lacking in intangible assets, particularly reputation and legitimacy, which affects firm's capability to exploit their proprietary assets across industries and national borders. Due to poorer brands and legitimacy, they need more time before products and services are accepted by

the local customers (Fombrun and Shanley, 1990; Hitt et al., 2000). In contrast, developed country MNEs possess stronger intangible assets. The home countries' institutional advantages (governance, legal system) may be transferred inside the MNE structure, leading to the MNE's improved reputation and legitimacy in overseas countries (Cantwell et al., 2010; Yang and Kwong, 2013). This might also help MNEs access local resources, customers and suppliers in the host country.

In sum, firms from emerging countries face greater resource constraints than their developed country counterparts in balancing two diversification strategies. Emerging country MNEs typically have insufficient managerial skills, financial resources and intangible assets to support the development in new product and geographic market at the same time. In contrast, developed country MNEs have sophisticated managerial skills, sufficient financial resources and strong intangible assets.

Hypothesis 3: The negative joint effect of product and international diversification is weaker for firms from developed countries rather than emerging countries.

4.3 Data

We collect the financial data from Orbis dataset which is made available by a consultancy called Bureau van Dijk. This database records each firm's NACE Rev.2 core, primary and secondary code, which allow us to calculate product diversification (defined as the number of segments). Orbis also records subsidiary's equity (defined as minimum 10.01 per cent equity) (Bureau of Economic Analysis US Department of Commerce., 1999) owned by parent and subsidiary's location, which allows us to identify domestic and overseas subsidiaries. Therefore, we can calculate the multinationality (defined as overseas/total subsidiaries). The firm's accounting information is available from 2004 to 2013, but the measures for the two diversification strategies are only available in the last available year in the dataset, which mostly is 2012. We select firms that have information on employees, sales, leverage, return on assets, industry code and number of subsidiaries. The final sample contains 13142 manufacturing firms. Data on GDP per capita and GDP growth are collected from World

Development Indicators.

4.4 Empirical Specification

Regression models with fixed effect estimators are employed. To examine the joint effect of two diversification strategies on performance, we present the following equation.

$$Y_i = \beta_1 PD_i \times MULT_i + \beta_2 PD_i + \beta_3 MULT_i + \lambda X_i + \gamma_t + \epsilon_i, \tag{4.1}$$

where Y_i refers to return on assets of firm i in t year. We include PD_i and $MULT_i$ to control the individual effects of product and international diversification. We also include control variables X_i, including firm size, leverage, sales per worker, GDP per capita, GDP growth, country and industry fixed effects. γ_t refers to time fixed effects. The key variable $PD_i \times MULT_i$ refers to the interaction term between product and international diversification. The parameter 1 indicates the joint effect of the two diversification strategies on firm performance.

Measurement of performance: We use the return on assets (PERF) (defined as net income divided by total assets) to measure firm performance (Y_i). Return on assets is commonly-used as a measure of financial performance in the international business literature (Ruigrok et al., 2007).

Product diversification: Our paper employs the number of segments (PD) in which a firm operates as a proxy for product diversification (Palich et al., 2000; Hoechle et al., 2012). We explored data availability in Orbis, and found difficulty in identifying the sales by industry for each firm. Thus we ruled out the Herfindahl measure, the entropy measure, and Rumelt's categories. Instead we use the number of segments, another common measure of product diversification, whose calculation is feasible since firms report core, primary and secondary NACE Rev.2 industry codes. To fully capture the product diversity of the firm, we calculate the PDit by taking the number of 4-digit industry codes (core, primary and secondary) reported

by both parent and majority-owned subsidiaries.

International diversification: This paper uses the number of overseas subsidiaries divided by total number of subsidiaries (MULT) as a proxy for multinationality or international diversification (Yang and Kwong, 2013; Castellani et al., 2017). After exploiting data availability in the Orbis dataset, we found difficulty in identifying foreign sales subtracting exporting and licensing when using FSTS (foreign/total sales) measure. Thus we did not use FSTS, as well as the highly correlated FATA (foreign/total assets) (Annavarjula et al., 2006). This paper instead employs OSTS (foreign/total subsidiaries), another common measure, which is feasible because Orbis dataset records parent's ownership of subsidiaries and subsidiaries' location.

Control variables: Following (Geringer et al., 2000), we control several firm characteristics that are believed to affect firm performance, including firm size, capital structure and labour productivity. Firm size (SIZE) is measured by employee count. Financial leverage (LEV) is the debt to equity ratio. Labour productivity (PROD) is calculated as sales divided by the number of employees. We also control for home country characteristics (Li and Qian, 2005), including GDP per capita (ECON) and GDP growth (GROW). In addition, we include country, industry and time fixed effects. Table 3.14 provides detailed definitions and data sources of the variables.

4.5 Descriptive Statistics

Table 3.15 presents descriptive statistics. On average, a firm has diversified into 5.96 industries and has 70 per cent subsidiaries located in overseas countries. We also find that, on average, return on assets is 3.00 per cent, labour force is 2631 employees, labour productivity is US$509.80 thousand, and the leverage ratio is 106 per cent. The right panel in Table 3.15 shows that most of the correlation coefficients are low.

4.6 Regression Results

Multiple regression models with fixed effect estimators are employed. We control for country, industry and time fixed effects. Table 3.16 presents the main estimates. There are 13142 observations in the full sample. Column 1 excludes any diversification measures. As we can see, the control variables have the expected signs. For instance, firm size and labour productivity both have positive signs, suggesting that large firms and firms with productive labour forces have better performance. Further, these signs remain largely unchanged across different specifications in columns 2-5.

Columns 5 in Table 3.16 tests hypothesis 1. Let us turn to the interaction term (PD $\times$ MULT) which reports a negative sign (significant at 10 per cent level), indicating that the joint effect of two diversification strategies negatively affects firm performance. This supports hypothesis 1. This shows the interactive effect of two diversification strategies on firm performance is substitute rather than complementary. Developing either new product or new geographic market requires tremendous investment. Due to resource constraints and growing bureaucratic costs, the firm faces a trade-off in allocating the resources among the two strategic options. The firm will experience difficulty if implementing the two strategies simultaneously. This is to some extent consistent with the results of other scholars' work (Geringer et al., 2000; Li and Qian, 2005).

Table 3.17 shows how industry and national contexts shape the joint effect. Columns 1-2 in Table 3.17 are to test hypothesis 2. Following the previous literature (Mayer et al., 2015) which emphasises the role of industry context in diversification strategies, we distinguish between MNEs in high-tech and low-tech sectors. The interaction term in column 1 is negative (significant at 5 per cent level), while the interaction term in column 2 is not significant. This supports hypothesis 2. The resource constraint problem is more severe in firms from high-tech sectors than those in low-tech sectors.

Columns 3-4 are used to test hypothesis 3. Following prior studies (Hitt et al.,

2000; Bebenroth and Hemmert, 2015) which highlight the role of national context in diversification strategies, we distinguish between developed country and emerging country MNEs. The interaction term is negative (significant at 5 per cent level) in column 3, while the interaction term in column 4 is not significant. This supports hypothesis 3. Compared to emerging country MNEs, the developed country MNEs have sophisticated managerial capabilities, sufficient financial resources and strong intangible assets (e.g., reputation and legitimacy), and thus face less severe resource constraints when implementing the two diversification strategies.

4.7 Discussion and Conclusions

The relationship between diversification strategies and firm financial performance has been discussed for more than 40 years (Castellani and Zanfei, 2006; Bowen and Sleuwaegen, 2017), with inconclusive empirical results. Most of the extant literature focuses on the individual effects of product or geographic diversification on the firm performance, but it has been argued that more research is required on the interactive effect of the two diversification strategies (Bowen and Sleuwaegen, 2017). Some recent papers do study the interaction of the two diversification strategies, supporting either a substitute or a complementary effect (Hitt et al., 1997; Geringer et al., 2000; Kistruck et al., 2013). However, these studies disregard the contextual factors that strengthen or weaken the joint effect. In addition, these previous studies mainly rely on data for US or Japanese firms (Sambharya, 1995; Denis et al., 2002; Bowen et al., 2015).

This paper addresses these limitations by analysing data for 13142 firms from 70 countries over the period 2004-13. The central finding is that there is a negative joint effect of two diversification strategies on firm performance, supporting the substitute relationship between two diversification strategies. Product diversification tends to substitute for, instead of complement, international diversification. The firm faces a trade-off between the two strategies due to resource constraints and the increased bureaucratic costs of implementing both strategies simultaneously in the

short-term. These results suggest that, when developing corporate strategy, firm need to consider the interaction between product and international diversification strategies. One suggestion is to combine different levels of the two diversification strategies. For example, Meyer (2006) suggests that globalfocusing' - increasing international diversification in a narrow range of products - promotes firm growth.

Further, we include the industry and national context in our research model, which is emphasised in the recent scholars' work (Bebenroth and Hemmert, 2015; Mayer et al., 2015). We find that, compared to low-tech sectors, firms from high-tech sectors experience a stronger negative joint effect of the two strategies. Also, we find that, relative to emerging country MNEs, developed country MNEs face a weaker negative joint effect of the two strategies. Thus, the interplay between the two diversification strategies depends on the technological intensity of the home sector and the economic development of the home country. All firms should consider their industry and national context when simultaneously implementing product and international diversification strategies.

The limitations of our paper need to be noted. First, the data are cross-sectional rather than panel, which does not allow us to control for firm fixed effects. Second, our analysis does not rule out potential reverse causality. Perhaps poor-performing firms expand into new product and geographic markets at the same time, expecting that performance will subsequently improve. Third, additional robustness checks would be helpful. We leave these topics for future research.

4.8 Tables and Figures

Figure 4.1: The Research Model

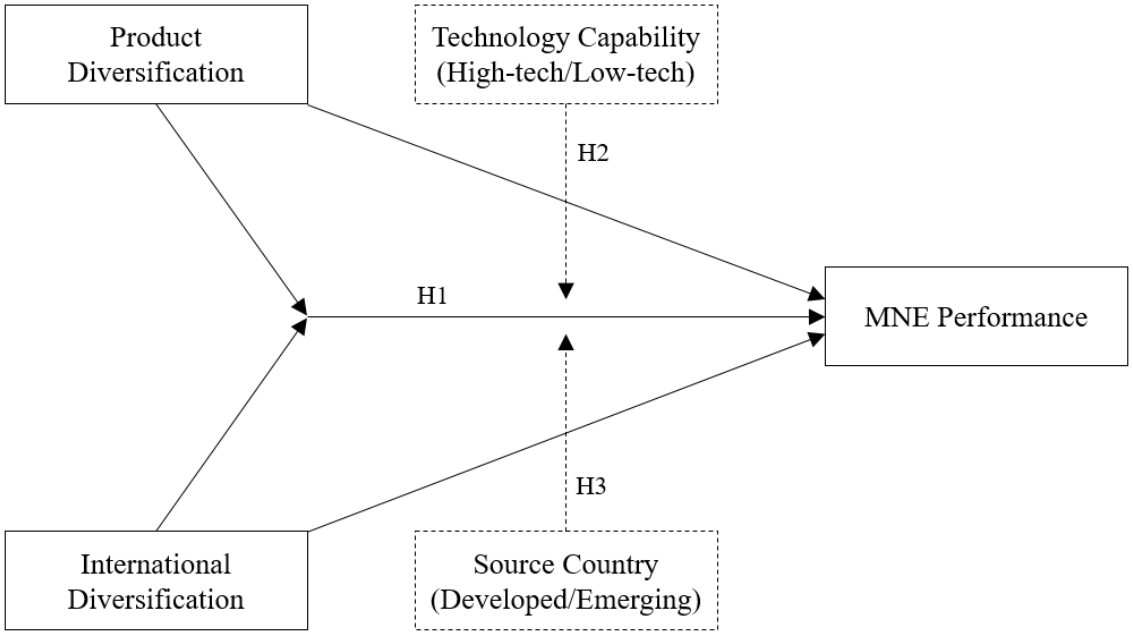


Table 4.1: Operationalization of Variables

Variable	**Operationalisation**	**Source**
PERF	The firm's return on assets using net income (ROA) (%)	Orbis
MULT	The ratio of the number of overseas subsidiaries to total number of subsidiaries	Orbis
PD	The natural logarithm of the number of segments (4-digit NACE Rev.2 codes) in parent and majority owned subsidiaries	Orbis
SIZE	The natural logarithm of the firm's number of employees	Orbis
LEV	The firm's debt to equity ratio	Orbis
PROD	The natural logarithm of the firm's sales divided by the number of employees (US$)	Orbis
ECON	The natural logarithm of the home country's GDP per capita (US$)	WDI
GROW	The home country's GDP growth (%)	WDI

Table 4.2: Descriptive Statistics and Correlations Matrix

	Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8
1	PERF	3.00	8.58	1.000							
2	PD	1.65	0.70	0.035***	1.000						
3	MULT	0.70	0.31	0.009	0.042***	1.000					
4	SIZE	5.80	1.88	0.075***	0.429***	-0.286***	1.000				
5	LEV	1.06	1.41	-0.247***	-0.046***	-0.015*	-0.059***	1.000			
6	PROD	12.58	0.92	0.142***	-0.007	-0.076***	-0.144***	0.046***	1.000		
7	ECON	10.47	0.62	-0.023***	0.116***	0.131***	-0.104***	0.016*	0.239***	1.000	
8	GROW	0.37	2.81	0.107***	0.082***	-0.211***	0.353***	-0.090***	-0.106***	-0.307***	1.000

Notes: Significance levels: *0.1; **0.05; ***0.01.

Table 4.3: Firm Diversification and Financial Performance: Main Results

	(1) All MNEs	(2) All MNEs	(3) All MNEs	(4) All MNEs	(5) All MNEs
PD × MULT					-0.5841*
					(0.340)
PD		-0.5809***		-0.7203***	-0.3084
		(0.127)		(0.129)	(0.260)
MULT			1.6414***	1.8555***	2.7252***
			(0.252)	(0.257)	(0.575)
SIZE	0.6152***	0.7301***	0.6783***	0.8290***	0.8255***
	(0.053)	(0.061)	(0.054)	(0.063)	(0.063)
LEV	-1.4849***	-1.4822***	-1.4767***	-1.4723***	-1.4743***
	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)
PROD	1.9200***	1.9615***	1.9672***	2.0248***	2.0216***
	(0.105)	(0.105)	(0.105)	(0.106)	(0.106)
ECON	-5.7475***	-5.9075***	-5.0152***	-5.1182***	-5.0776***
	(1.437)	(1.446)	(1.429)	(1.435)	(1.434)
GROW	0.1555*	0.1690*	0.1450	0.1605*	0.1603*
	(0.093)	(0.093)	(0.093)	(0.093)	(0.092)
Country Fixed Effect	X	X	X	X	X
Industry Fixed Effect	X	X	X	X	X
Time Fixed Effect	X	X	X	X	X
Adj R-squared	0.142	0.143	0.145	0.146	0.147
No. observation	13142	13142	13142	13142	13142
F statistics	36.005	35.341	36.038	35.518	34.757

Notes: The dependent variable is the return on assets. All models control for country, industry and time fixed effects. Values in parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 4.4: Firm Diversification and Financial Performance: Sectoral and Source Country Analysis

	(1) High-tech sectors	(2) Low-tech sectors	(3) Emerging countries	(4) Developed countries
PD × MULT	-2.3369**	-0.1934	-1.6836**	-0.5029
	(1.090)	(0.349)	(0.799)	(0.380)
PD	0.8887	-0.5888**	-0.1947	-0.3125
	(0.845)	(0.265)	(0.583)	(0.292)
MULT	4.7654**	2.1389***	5.1970***	2.4662***
	(1.912)	(0.587)	(1.539)	(0.619)
SIZE	1.4052***	0.6642***	0.6828***	0.8505***
	(0.181)	(0.066)	(0.146)	(0.070)
LEV	-2.1212***	-1.4349***	-2.1243***	-1.4132***
	(0.212)	(0.055)	(0.215)	(0.056)
PROD	2.3117***	1.9378***	1.2765***	2.1903***
	(0.280)	(0.113)	(0.204)	(0.122)
ECON	-0.2663	-6.1518***	0.5658	-7.3562***
	(5.789)	(1.248)	(2.993)	(2.347)
GROW	-0.2079	0.2652***	0.2793	0.1668
	(0.291)	(0.096)	(0.213)	(0.121)
Country Fixed Effect	X	X	X	X
Industry Fixed Effect	X	X	X	X
Time Fixed Effect	X	X	X	X
Adj R-squared	0.142	0.159	0.192	0.145
No. observation	2113	11029	1775	11367
F statistics	12.770	31.339	6.848	30.126

Notes: The dependent variable is the return on assets.

Chapter 5

Target Firm Performance of Foreign and Domestic Acquisitions

5.1 Introduction

The performance implications of foreign acquisition has remained an important research topic for business scholars over the past 30 years (Conn and Connell, 1990; Aw and Chatterjee, 2004; Claessens and Van Horen, 2012; Shaban and James, 2018). Foreign acquisition causes two opposing effects on a target firm's performance. On the one hand, the target faces various costs such as post-acquisition integration problems and agency costs. On the other hand, the target enjoys several benefits such as knowledge transfer from more productive Multinational Enterprises (MNEs) and synergistic gain. This leads to the conflicting results of foreign acquisition performance study. These conflicting results require the consideration of potentially ignored moderators.

This paper seeks to link the acquirer's characteristics to the debate on the foreign acquisition-performance relationship. To date, the critiques on the foreign acquisition premium literature have given insufficient attention to the target's performance (Haleblian et al., 2009), although there is well-established literature on the acquirer's performance that is, on average, enhanced after acquisition. Also, extant literature generates mixed findings, including positive, negative or no relationship between foreign acquisition and target firm performance (Harris and Robinson, 2002; Maksimovic et al., 2011; Geluebcke, 2015). This is in part because the acquirer's characteristics has been ignored in most prior studies. In addition, in most cases, their arguments and empirical results are based on the analysis of one or two countries. This limits the generalisability of their findings and their application to other countries (Chen, 2008). Drawing on panel data of 3,202 firm-year observations across 45 economies between 2004-2013, we aim to fill these gaps by providing a better understanding of foreign acquisition and its performance implications.

Our research topic examines the impact of foreign acquisition on performance with the consideration of acquirer's characteristics, including acquirer's location and multinationality. We propose three hypotheses. First, we investigate whether the subsidiaries involved in foreign acquisitions perform better than those involved in

domestic acquisitions. Second, we test whether this effect is moderated by the acquirer's location. Third, we investigate whether this effect is moderated by the acquirer's multinationality.

Our paper has made three contributions. First, most extant literature focuses on the performance of the acquiring firm (Haleblian et al., 2009; Bebenroth and Hemmert, 2015). They focus on the acquiring firm's short-term performance, such as stock price. However, our paper focuses on the acquired firm's performance, particularly their productivity, which is seen as the real driver of a firm's long-term growth (Mallick and Yang, 2014). Second, Previous foreign acquisition studies merely compare the performance between foreign and domestic acquisition (Bertrand and Zitouna, 2008; Geluebcke, 2015), disregarding some important moderating effects. Their findings on a target's performance are ambiguous. Some studies find improved target firm performance after the acquisition. Some find a deterioration in a target's performance after the acquisition. These seemingly conflicting results may be partly due to their ignorance of acquirer's important characteristics, which have a great impact on the foreign acquisition-performance relationship. Our paper provides a systematic analysis of foreign acquisition performance by considering the moderating role of acquirer's key characteristics, namely their location and multinationality, thus contributing to this debate. Third, previous studies mainly use a single or two country study (Chen, 2011; Bertrand and Betschinger, 2012; Bebenroth and Hemmert, 2015), while our paper has a larger coverage of 45 countries, making the generalisability of our findings to various countries possible.

As in prior related research, we find a foreign acquisition premium for target firms, but additional factors matter. Compared with domestic acquisition, we find that foreign acquisition has a larger positive impact on a target firm's performance. Also, we find that this main impact is positively moderated by the acquirer's location, particularly when the acquirer is from a developed country. Similarly, we find that this main effect is positively moderated by the acquirer's multinationality.

The structure of the paper is as follows. Section 2 reviews the relevant literature

and develops the hypotheses. Section 3 discusses the data and empirical strategy, after which Section 4 presents and discusses the empirical results. The final section provides discussion, conclusions and limitations.

5.2 Literature Review and Hypotheses Development

There are several motivations for acquisition, including managerial hubris, management's comparative advantage and synergy effects (Balsvik and Haller, 2010). First, managerial hubris refers to managers' inclination to increase their power by maximising the firm size (Jensen, 1986). Mergers and acquisitions are a quick way of achieving this goal. When the firm has free cash flow, instead of distributing it through dividend payments to shareholders, managers tend to retain them within the firm by investing this money in investment projects.

The second motivation is about matching management's comparative advantage with a firm's boundary. Acquisition provides a quick way of adjusting firm size after an industry shock that alters a firm's comparative advantage, leading to the enhanced match between a firm's comparative advantage and a firm's boundary. Firm size distribution is a way of effectively allocating productive factors over managerial talent so that the firm can achieve the greatest output (Lucas Jr, 1978). Specifically, the firm has a boundary that is set by its and its competitor's management's comparative advantage. From the perspective of the firm, the firm initially uses its managerial talents in industries where it can retain the largest marginal gain. After industry shocks, the firm has to adjust its boundary by buying or selling plants to reflect their altered comparative advantage (Lichtenberg et al., 1987). In the perspective of the plant (target firm), low productivity in a plant (which, according to matching theory, implies a poor match between the plant and its owner), tends to induce a change in its ownership. This change in ownership is likely to lead to an increase in productivity, since the new match is expected to have higher value

(Lichtenberg et al., 1987).

Third, the synergy effect argues that the firm acquired a target that, to some extent, shares industry relatedness with the acquiring firm. This relatedness can create synergic effects that improve both firms' efficiency (Balsvik and Haller, 2010). For instance, unlike prior studies that argue that poor performance induces acquisition (Lichtenberg et al., 1987), McGuckin and Nguyen (1995) find that US plants with above average productivity are acquired, and experience further improvement in productivity. This finding is consistent with the view that synergy effects and their related efficiency gains are also important motives for acquisitions.

5.2.1 Acquisition and Target Firm Performance

While the above argument does not distinguish between foreign and domestic acquisition, the nationality of the acquirer matters. Foreign acquisition differs from domestic acquisition because the former enters a new geographic market and faces a different environment compared with their home market (Balsvik and Haller, 2010). Compared with domestic acquisition, foreign acquisition faces various costs and benefits when acquiring and managing an acquired firm across country borders.

There is considerable literature on the foreign acquisition-performance relationship, but much of it relies on data on developed countries. The previous studies provide mixed results (see a summary of previous 38 studies' findings in the Appendix A, Table 4.5-4.6). Some scholars find a positive relationship between foreign acquisition and performance (Conn and Connell, 1990; Harris and Ravenscraft, 1991; Cebenoyan et al., 1992; Swenson, 1993; Cheng and Chan, 1995; Eun et al., 1996; Ning et al., 2014). However, others find a negative relationship (Aw and Chatterjee, 2004; Moeller and Schlingemann, 2005). Some studies also find an insignificant relationship (Cakici et al., 1991; Dewenter, 1995; Danbolt, 2004; Aybar and Ficici, 2009).

It can be seen that prior studies provide rather mixed evidence of the foreign acquisition-performance relationship. In part, this may be due to the ignorance

of important variables such the acquirer's characteristics (e.g., acquirer's location and multinationality), which will be considered in our paper. In addition, these findings are mostly based on one country study (mainly US, UK firms), with only a few exemptions (Aybar and Ficici, 2009; Galavotti et al., 2017). This limits the generalisability of their findings and application to other countries.

Cross-border acquisitions are becoming increasingly common among MNEs and the pivotal factor driving the rebound of global FDI flow. Recent years have witnessed a huge surge of cross-border acquisition. There is a high level of cross-border acquisitions among developed economies, as well as between developing and developed economies. For instance, some cases in the spotlight are China's Wanda group's acquisition of AMC theatres and Legendary Entertainment, and China's Haier's acquisition of GE appliances in the US. It is interesting and fascinating for academics to understand why firms conduct acquisition and how the target firm subsequently perform (see Figure 4.1 for the research model of our paper).

Foreign acquisition could incur some costs. Managers may make decisions based on their personal rather than their shareholder's interests, which is to maximise the firm value. One of the manager's personal interests is higher remuneration, which is linked to acquisition activity. Previous studies have found that the acquisition is accompanied by permanent increases in manager's remuneration (Yim, 2013). Unlike large capital expenditure (internal investment), acquisition (external investment) is associated with a large increase in remuneration, partly due to the uncertainty and information asymmetry in an acquisition that need the CEO's skills and efforts (Harford and Li, 2007). On average, a manager obtains an increase of US$300,000 in their remuneration. From all firms, 39 per cent reward their CEO for completing any acquisition (Grinstein and Hribar, 2004).

Another personal interest of the manager, reducing employment risk, could be achieved by building a business empire (Gomez-Mejia and Wiseman, 1997). Managers who undertake acquisitions are less likely to be fired. The combination of a lower employment risk and permanent remuneration increase greatly induces man-

agers to engage in acquisitions (Yim, 2013). On average, foreign acquisitions are larger than domestic acquisitions. Since greater firm size and more complex global operation require higher pay for managers (Rosen, 1990; Duru and Reeb, 2002; Genç, 2016), they tend to choose foreign over domestic acquisitions, even if the foreign deal has low synergic potential and is overvalued (Harford et al., 2012).

Agency costs, however, can be reduced by the strengthened corporate governance structure that could be brought into the target firm by foreign ownership. It is argued that, when the institution is weak, ownership concentration, particularly for foreign owners, can strengthen corporate governance structure and reduce the agency costs. Specifically, foreign owners tend to contribute to the target firm's performance by committing more resources (e.g., know-how and organisational resources) to knowledge transfer (Chhibber and Majumdar, 1999; Heugens et al., 2009), and by transferring the best practice of corporate governance. Since foreign acquirers usually have subsidiaries in diverse jurisdictions, they are more experienced in choosing appropriate benchmarks for corporate governance (Douma et al., 2006). Foreign MNEs, by exhibiting greater ownership concentration (Chhibber and Majumdar, 1999), can effectively set up control and monitoring mechanisms such as auditing, budget control and incentive systems, which maximise firm performance (Jensen and Meckling, 1976). In contrast, domestic ownership, usually associated with business group affiliation and family ownership (particularly in Asia), transfers ineffective cross-subsidising and tunnelling practices derived from cross-holdings (Heugens et al., 2009).

Similar to the information asymmetry in the lemon market, where sellers possess more information of the goods, such as used cars, than the buyer (Akerlof, 1970), the target firm is inclined to have more information about the true value of itself than the acquirer. This information asymmetry is more obvious in the international market. Due to the distance between countries (Berry et al., 2010), it is difficult for foreign acquirers to value the target, who has a different language and legal system from the former (Genç, 2016). However, information asymmetry could be alleviated

when the MNEs learn local knowledge gained through the host country experience. Host country experience plays a key role in developing acquirer's knowledge and capabilities of operating in a new and unfamiliar environment (Gaur and Lu, 2007).

Foreign acquirers face liabilities of foreignness and coordination costs when entering the overseas market (Zaheer and Mosakowski, 1997; Shimizu et al., 2004). Foreign acquirers have a lack of local information and legitimacy; it takes time and effort to build a relationship with customers, suppliers and governments. Also, the coordination between an acquirer's and target's employees is difficult due to the acquirer and target countries' different culture and institutional environments (Qian et al., 2008). However, compared with foreign greenfield investment, which requires foreign investors to start from scratch by recruiting new local employees and finding new local customers, foreign acquisition saves a great deal of learning time when doing business in foreign markets. This is because foreign acquirers use existing managers and employees who have local experience. This local experience greatly shortens the time required to overcome the liability of foreignness for the foreign acquirer (Gaur and Lu, 2007). Also, MNEs tend to be more productive than domestic firms, and have strong ownership-specific advantage (Bamiatzi et al., 2017; Liu, Chung, Sul and Wang, 2017); this helps to overcome the liability of foreignness and high coordination costs. In addition, as the MNEs gain more experience in the host country, the liabilities of foreignness, such as the lack of local information, will be reduced (Zaheer, 1995).

Foreign acquisition can also bring various benefits. First, the production rationalisation gain or accessing cheaper inputs, which refer to gains from reduced production costs by using cheaper inputs in the foreign countries, such as cheap labour and national resources (Dunning, 1988; Contractor, 2007), could be larger in the foreign acquisition. Acquirer and target firms are likely to differ in factor costs when they are locating in different countries. This is because countries usually have different factor endowments in capital and labour (Berry, 2006), as well as regulations regarding financial markets and the minimum wage. In addition, acquirer

and target firms might benefit from reduced transaction costs and better access to foreign markets (Bertrand and Zitouna, 2008).

Second, foreign acquisitions have a greater impact on performance than domestic acquisitions in the market; this is due to the greater synergistic effect. The synergistic effect tends to be larger for foreign acquisitions than for domestic acquisitions, resulting from the increased diffusion of know-how within the merging firms. Specifically, merging firms locating in countries with different technological environments are more likely to have different technological characteristics and complementary assets, leading to the diffusion of know-how within acquirer-target links (Bertrand and Zitouna, 2008).

Third, greater efficiency gain can be expected for foreign acquisitions due to the firm-specific advantage brought by foreign acquirers to the host country (Doukas and Travlos, 1988; Douma et al., 2006; Heugens et al., 2009; Bamiatzi et al., 2017). Generally, domestic and foreign acquisitions may lead to efficiency gains for the target firms, while this gain is larger for foreign acquisitions than for domestic acquisitions (Bertrand and Zitouna, 2006). MNEs are traditionally seen as the firms that have valuable intangible assets before going abroad (Bamiatzi et al., 2017). To overcome the large liability of foreignness and huge initial investment cost, they must have higher productivity than domestic firms and exporters (Helpman et al., 2004). Through foreign acquisition, they leverage their knowledge across the border and earn high rent from it. The target can benefit from this process. The foreign acquirer can introduce new technology, management competence and marketing skills to the target firm (Dunning, 1998; Douma et al., 2006), improving the target firm's performance, particularly their productivity performance. Although the knowledge flow between parent and subsidiary comes from MNE's internalisation theory, this theory can also be extended to explain the knowledge exchange between acquirer and target in the context of foreign acquisition (Liu, Chung, Sul and Wang, 2017). Previous studies find that Chinese banks that have partial foreign ownership are inclined to have significant higher profit and efficiency gain, given the foreign bank's

better access to capital and innovativeness such as employing new management systems and process innovation (Ariff and Luc, 2008; Jiang et al., 2009, 2013; Shaban and James, 2018).

Overall, compared to domestic acquisition, foreign acquisition tends to bring various benefits that exceed its costs. First, foreign acquisition is associated with foreign ownership that brings a new management style and incentive system to the target firm. Improved corporate governance leads to reduced agency costs and improved firm performance (Heugens et al., 2009). Next, hiring existing managers and employees during foreign acquisition helps to overcome the liability of foreignness since they have local knowledge and experience (Gaur and Lu, 2007). Third, accessing cheaper inputs, which are not available to domestic acquisitions, can be realised in foreign acquisitions, leading to a higher cost efficiency gain for foreign acquisitions (Dunning, 1988). Fourth, the synergistic effect tends to be larger for foreign acquisitions than for domestic acquisitions; this is due to increased know-how diffusion within the merging firms (Bertrand and Zitouna, 2008). Fifth, the efficiency gain is greater for foreign acquisitions than for domestic acquisitions. Foreign MNEs tend to be more productive and have stronger ownership-specific advantage in order to go abroad. They tend to exploit their strong intangible assets across the national border by internalising these intangible assets. The transfer of knowledge-based firm-specific advantage by MNEs to foreign subsidiaries through acquisition could enhance the foreign subsidiary's performance, particularly productivity (Helpman et al., 2004; Douma et al., 2006; Bamiatzi et al., 2017). Based on the above arguments, we propose the following hypothesis.

Hypothesis 1: Target firms involved in foreign acquisition perform better than those involved in domestic acquisition.

5.2.2 The Moderating Role of Acquirer's Country of Origin

Most of the foreign acquisition premium literature concentrates on discussing the benefits and costs of foreign ownership, while ignoring the importance of home

country characteristics (Claessens and Van Horen, 2012).

First, the high-income customers, advanced technology and strong institutional environment in the foreign acquirer's home country tend to have a positive effect on a target's performance. On the one hand, developing countries usually have low-income customers (Qian et al., 2008): they are less demanding and more likely to be satisfied by products with basic functions, or with technology that has been prevalent in a developed country for several years. In addition, the less advanced knowledge resource in the domestic market limits the developing country MNE's ability to develop technology capability and innovate new products (Luo and Tung, 2007). The weak intellectual property protection in developing countries encourages firms to focus more on producing labour-intensive products than investing in innovation and creating technology-intensive products (Gaur and Kumar, 2009). Thus, developing country firms are less willing and able to produce innovative products. On the other hand, developed countries have demanding customers and corresponding high market competition. This can influence a firm's efficiency in operations (Aghion et al., 1998; Claessens and Van Horen, 2012), as they feel pressure to improve the quality of products, use the newest technology, and innovate new products to attract customers. Also, the technological resource in an advanced country can help advanced country MNEs develop technology capability and accumulate intangible assets, such as research and development (R&D) products that are protected under strong intellectual property laws. This encourages firms to invest more in innovation and foster the growth of innovative products and services, enhancing operational efficiency (Bebenroth and Hemmert, 2015). The improved efficiency in headquarters can be transferred to foreign targets and improve their efficiency in operations.

Second, the high-quality labour and well-developed financial markets in a foreign acquirer's home country tend to positively affect a target's performance. On the one hand, as we can observe from the education and wage levels, the low-quality labour force in developing countries tends to be used to produce labour-intensive products;

they need longer to learn and help firms adopt the newest technology and equipment. Also, it is difficult for developing country MNEs to seek financial resources in underdeveloped domestic financial markets to fund their overseas projects (Svetličič and Rojec, 1994; Hitt et al., 2000). On the other hand, the highly-educated employees in a developed country can easily learn the latest technology and use it to improve the productivity of the firm (Berger et al., 2000). Developed countries generally have a developed financial market, regulatory system and relevant government policy to support a firm's international activity (Li and Qian, 2005). This makes it possible for firms to take part in high risk-high return overseas projects, such as investment projects in developing countries (Claessens and Van Horen, 2012). The above benefits tend to be more evident in foreign acquisitions than in domestic acquisitions.

Third, MNEs from developed and developing countries have different managerial objectives for foreign investment, which have performance implications on the target firms' performance. On the one hand, as discussed above, developed country MNEs typically have competitive advantages such as innovative products, higher operational efficiency, sufficient financial resources, and productive labour, which are closely related to the home country's institutional environments such as demanding customers, advanced financial markets, highly educated labour and strong intellectual property protection (Porter, 1990; Li and Qian, 2005; Gaur and Kumar, 2009). Developed country MNEs attempt to exploit these advantages in overseas markets (Dunning, 2001). The targets that are acquired by advanced country MNEs are inclined to benefit from the transfer of resource and knowledge from the acquirer's home country, leading to the target firms' superior performance. On the other hand, developing country MNEs have lower efficiency, lower quality of capital, labour and products, which are linked to the less supportive institutional environment in the home country (Hitt et al., 2000; Qian et al., 2008). Hence, they are inclined to use FDI as a means of seeking strategic new assets rather than exploiting existing assets (Dunning, 2000; Luo and Tung, 2007). They tend to learn and transfer advanced technology and managerial know-how back to the home country (Makino et al.,

2002). They focus on exploiting the valuable resources (e.g., advanced technology and managerial know-how) of the target firm rather than transfer the home country's resources to the target. Consequently, the target firms benefit less from, or even are potentially exploited by, the developing country acquirers, leading to a reduced foreign acquisition premium.

Overall, the different institutional environments and managerial objectives lead to the performance difference in the target firms. The developing countries' less supportive institutional environment contributes to the acquirer's lack of resources. The acquirers tend to seek overseas strategic assets rather than exploiting their existing assets (Makino et al., 2002; Luo and Tung, 2007). Target firms have fewer benefits, or even potentially gain a detrimental effect from foreign acquisitions. On the other hand, the developed countries' supportive institutional environment facilitates multinational acquirer's innovation activities, operational efficiency, learning and funding for overseas projects (Berger et al., 2000; Gaur and Kumar, 2009; Bebenroth and Hemmert, 2015). When the acquirers exploit these competitive advantages (Dunning, 2001), the target firms benefit from the transfer of resources and knowledge from the acquirer's home country. These benefits tend to be more evident in foreign acquisitions than domestic acquisitions. In summary, compared with developing country acquirers, foreign acquisitions by developed country acquirers are willing and able to transfer more resources and knowledge from the home country to the target firms, leading to the target firm's superior performance.

Hypothesis 2: Acquirer's developed country location positively moderates the relationship between acquisition type and target firm's performance. Specifically, relative to domestic acquisition, the target firm's additional performance gain from foreign acquisition is stronger when the acquirer originates from a developed rather than a developing country.

5.2.3 The Moderating Role of Acquirer's Multinationality

Previous studies on internalisation theory focus on the MNE's knowledge transfer to a subsidiary and view it as a key determinant of the subsidiary's performance. However, few studies have analysed the MNE's capability and experience in making effective knowledge transfer. According to the internalisation theory, an MNE internalises the valuable intangible assets (e.g., patents, trademarks), and exploits them through their foreign subsidiaries, sustaining the foreign subsidiary's superior performance in overseas markets (Bamiatzi et al., 2017). The ability to internalise the intangible assets in part relies on an MNE's capability. (Uhlenbruck, 2004) states that the parent's capability is vital in transferring knowledge to a foreign subsidiary in order to enhance the foreign subsidiary's competitive advantage. This capability can reduce the intra-firm transaction costs of internal knowledge transfer and better manage the subsidiary's resources to compete in the foreign market. This is of more particular importance in foreign acquisitions than in domestic acquisitions.

We extend this capability to a general internalisation capability, in the context of the link between multinationality and the transfer of firm-specific advantage. The MNE enhances its capability of internationalisation from repeated practice of international activities, including acquiring and setting up foreign subsidiaries. The repeated process of acquiring or establishing a foreign subsidiary helps to set up an effective organisational routine (Eisenhardt and Martin, 2000). In turn, this helps to integrate the target into the multinational network and increase its post-acquisition performance in foreign markets. The multinationality tends to improve multinational operational flexibility, and facilitates the transfer of knowledge-based firm-specific advantage from the headquarters to the foreign subsidiaries (Dunning, 2001; Driffield et al., 2016).

To some extent, multinationality represents an acquirer's experience (Mayer et al., 2015), which could help MNEs identify similar targets and avoid dissimilar targets, enhancing the acquisition performance (Haleblian and Finkelstein, 1999). Similarly, acquirers with high multinationality might have already undertaken many

acquisitions, and gained knowledge about how to find a suitable foreign target in the context of information asymmetry between the acquirer and the potential target. Thus, acquirers are more likely to identify promising targets. Specifically, unlike greenfield investment that does not need a suitable target, the success of an acquisition relies highly on an acquirer's ability to do the screening of global markets and select acquisition targets with high potential. Failure to select the right target will greatly increase the costs of acquisition. For instance, the over-valuation of a target (Akerlof, 1970; Genç, 2016) is a common problem in acquisitions, which can impede the performance of both acquirer and target.

The experience could also help parent companies avoid problems in the integration process that are due to the small organisational fit between the acquirer and the target, and help the growth of subsidiary after acquisition (Uhlenbruck and De Castro, 2000). Similarly, MNEs with high multinationality might already have previously undertaken many acquisitions, and learned knowledge about how to integrate effectively and further develop the acquired target after acquisition. Thus, the MNEs can quickly find specific solutions to integration problems during the post-acquisition process, and enhance the acquired target's competitive advantage. Specifically, during the post-acquisition integration process, the diverse cultures involved in foreign acquisition, including corporate and national cultures between the acquirer and target, can lead to a culture clash (Buono et al., 1985). A common language is likely to reduce communication issues and misunderstandings between the employees (Krug and Nigh, 2001). In contrast, different languages add to difficulties in the cooperation between employee groups from the acquired and acquiring firms. Finding themselves unable to fit into the new organisational culture, the existing employees are more stressed and less committed, which negatively affects employee performance and thus organisational performance (Cartwright and Cooper, 1990; Genç, 2016). Nevertheless, the MNEs' capability and prior acquisition experience can mitigate the integration costs and incorporate the acquired firm into the MNE's multinational network (Uhlenbruck, 2004).

Experience plays an important role in the effective transfer of firm-specific resources across borders (Gaur and Lu, 2007). Through experiential learning in foreign expansion, a firm can obtain the necessary foreign knowledge, including general knowledge and market-specific knowledge (Johanson and Vahlne, 1977). Market-specific knowledge greatly helps the MNE operate in an unfamiliar environment and build a relationship with local firms and governments. This knowledge also helps the MNE understand local customers' needs and choose appropriate marketing and branding strategies to attract customers, enhancing MNE's local legitimacy. The effective transfer of firm-specific resources between merging firms locating in different countries is challenging.

The adoption and institutionalisation of new management practices in the acquired target is difficult due to the difference in the formal and informal institution between home and host countries. Firms with high host country experience learn knowledge of the host country environment; this helps the acquired target adapt the new management practices to the local environment (Luo, 1997; Jensen and Szulanski, 2004; Gaur et al., 2007). Similarly, firms with high multinationality may have operated in many host countries and learned a great deal of knowledge about the local culture and institutions. This can help the target make some adaptations of the new management practices in the context of the host country environment.

On the other hand, in domestic acquisitions, multinationality tends to play a less important role. As in the same economy, the employees of acquiring and acquired firm speak the same language, and the cultural difference is expected to be low in the domestic market (Krug and Nigh, 2001). The post-acquisition integration of domestic acquisitions tends to be easier than with foreign acquisitions. Therefore, the MNE's transfer of knowledge-based firm-specific advantage to the domestic target is smoother than with a foreign target.

Overall, in foreign acquisitions, the transfer of firm-specific resources between merging firms in different countries is challenging. To some extent, however, the multinationality represents an acquirer's capability and experience (Uhlenbruck,

2004; Mayer et al., 2015). This helps the MNE identify appropriate targets, and establish efficient organisational routines, effectively integrating and further developing the target after acquisition (Driffield et al., 2016; Genç, 2016). Multinationality enables firms to effectively transfer the knowledge-based firm-specific advantage from the acquirer to the foreign target, enhancing the foreign target's performance (Gaur and Lu, 2007); while these benefits are less evident in domestic acquisitions.

Hypothesis 3: Acquirer's multinationality positively moderates the relationship between acquisition type and target firm's performance. Specifically, relative to domestic acquisitions, the target firm's additional performance gain from foreign acquisition is greater when the acquirer has a high degree of multinationality.

5.3 Method

5.3.1 Data

We collect the financial data from Orbis dataset which is made available by a consultancy called Bureau van Dijk. This dataset is widely used in the international business field (Contractor et al., 2016). We select subsidiaries who have location and sector information, and whose minimum 10 per cent (Bureau of Economic Analysis US Department of Commerce., 1999) shares are controlled by the parents. The time period is 2004-2013. M&A (Merge & Acquisition) deals information are collected from Zephyr, another dataset made available by Bureau van Dijk, which is widely used in the acquisition literature (Bauer and Matzler, 2014; Galavotti et al., 2017; Shaban and James, 2018). We select the completed and completed assumed M&A transactions that occurred before 2013. We then merge the data from Orbis with the data from Zephyr using the unique BvD ID of each firm to identify the acquirer-target linkages that are involved in M&A transactions.

After merging two data, we identify targets that are linked to acquirers through acquisition activities. We further distinguish domestic and foreign acquisition by comparing acquirer and target's country information. We select targets that have

available information on leverage, sales, labour, capital, intermedia input, as well as the involvement in acquisition activity. With the above restrictions, the final sample contains 520 acquirers and 657 acquisitions/affiliates from 45 countries (39 home countries and 32 host countries) for the period of 2004-2013, corresponding to 3,202 unique acquirer-target-year observation. The data availability on firms' total factor productivity lead to an exclusion of several firms in the sample. However, this is not a relevant problem, since we still have a large dataset comparable to the Zephyr dataset used in other multi-country studies. For instance, the sample used in (Galavotti et al., 2017)'s study contains 689 acquisitions/observations by 464 acquirers from 60 countries in the period 2007-2013. The country-level data, GDP per capita and GDP growth, are retrieved from World Development Indicators.

5.3.2 The Empirical Specification

Multiple regression model with fixed effect estimators is employed. To examine the relationship between acquisition type (foreign/domesic) and target firm's performance, and the moderating role of several acquirer's characteristics (location and multinationality), we present the following equations.

$$Y_{it} = \beta_1 FORA_{it} + \lambda X_{it} + \gamma_t + \epsilon_{it}, \tag{5.1}$$

$$Y_{it} = \beta_2 FORA_{it} + \beta_3 FORA_{it} \times Z_{it} + \lambda X_{it} + \gamma_t + \epsilon_{it}, \tag{5.2}$$

Where Y_{it} refers to TFP of firm i in t year. The key independent variable foreign acquisition refers to a dummy variable, which equals to one if it is foreign acquisition and equals to zero if it is domestic acquisition. Z_{it} refers to the key moderators, namely acquirer's country of origin and multinationality. This equation also contains control variables X_{it}, including Employees, leverage, sales per worker, country fixed effects and industry fixed effects, parent firm fixed effects. Gamma refers to time fixed effects. The key parameter is β_1, which suggest the effect of foreign acquisition activity on target's performance.

Measurement of Target Firm Performance: Following prior studies (Bertrand and Zitouna, 2008; Liu, Chung, Sul and Wang, 2017), we use performance measure *total factor productivity* (PERF). TFP (total factor productivity) is perhaps the most difficult to calculate variable due to its data requirements. However, it is also the standard approach and often employed to generate the standard and precise estimates of performance (Olley and Pakes, 1996; Levinsohn and Petrin, 2003; Yang and Mallick, 2010).

TFP measures the efficiency of the firm to generate outputs by combining a set of inputs, which is generally accepted as the proxy of technology efficiency. When two firms generate different outputs by using the same amount of general inputs (e.g., labour, capital, intermedia input) in the production process, the difference is usually explained by technology, which is captured by TFP. Following (Levinsohn and Petrin, 2003)'s (LP) approach, we use the Stata command 'levpet' to calculate the total factor productivity. Production function is assumed to be Cobb Douglas, and as follows.

$$Output_{it} = \beta_0 + \beta_k K_{it} + \beta_l L_{it} + \beta_m M_{it} + \omega_{it} + \eta_{it}, \tag{5.3}$$

where $Output_{it}$ is the total revenue of firm i in year t, K_{it} is the fixed capital of firm i in year t, L_{it} is the number of employees of firm i in year t. M_{it} is the total expenditure on intermediate goods of firm i in year t, which is employed as an instrument to control for the unobservable technology shocks on the estimation procedure of LP approach. All variables are in the logarithm. The error terms contain two components, including the transmitted component ω_{it} and the component η_{it} that is not correlated with the input choices (Levinsohn and Petrin, 2003). After running the above equation using the 'levpet' Stata command, we then use 'predict' command to generate predicted levels of productivity it based on the following equation.

$$\hat{\omega_{it}} = exp(Output_{it} - \hat{\beta}_k K_{it} + \hat{\beta}_l L_{it} + \hat{\beta}_m M_{it}), \tag{5.4}$$

where 'predict' assumes that all inputs are in logarithm levels and adjust ω_{it} accordingly (Petrin et al., 2004; Mallick and Yang, 2013).

Acquisition Type: Following prior studies (Claessens and Van Horen, 2012; Liu, Chung, Sul and Wang, 2017), we employ a dummy as a proxy for the acquisition type. We create variable foreign acquisition to distinguish between foreign and domestic acquisition. Foreign acquisition is a dummy that equals to 1 if the acquirer's country is different from the target's country, equals to 0 if the acquirer and target come from the same country (FORA).

Acquirer's Country of Origin: We consider two important acquirer's characteristics, namely country of origin and multinationality. First of all, to examine the role of acquirer's country of origin, we create variable developed country acquirer. Developed country acquirer is a dummy that equals to one if the acquirer is locating in a developed country, equals to zero if the acquirer is in a developing country (DEDA).

Acquirer's Multinationality: To examine the role of acquirer's experience of being multinational, we created variable multinationality. Multinationality is the ratio of the number of overseas subsidiaries to total number of subsidiaries (MULT) (Yang and Kwong, 2013; Castellani et al., 2017).

Control Variables: We control several firm-level characteristics that are believed to affect firm performance, including firm size, financial leverage and labour productivity and age. Larger firms incline to have performance that is superior to that of small firms. Firm size (SIZE) is measured by the number of employees (Li, 1995; Bebenroth and Hemmert, 2015). Financial leverage is expected to have a negative relationship with firm performance. The firm has to turn down value-adding investment opportunities due to the risky debts and the corresponding sub-optimal investment strategy (Myers, 1977). Leverage (LEV) is the debt to equity ratio. Firms with more productive labour usually has better performance than firms with less productive labour. Labour productivity (PROD) is calculated as total sales divided by the number of employees (Yang et al., 2014). Firm age, as a kind of

experience, may influence the business performance. Firm age (AGE) is calculated as the duration of operation since the firm's start-up date (Bebenroth and Hemmert, 2015).

We control dyadic-level variable such as diversification acquisition dummy. As the industry difference between acquirer and target may influence target's performance. Diversification acquisition (DIV) equals 1 if the acquirer conduct the acquisition using diversification strategy (different 4-digit NACE Rev.2 industries) (Balsvik and Haller, 2010; Bebenroth and Hemmert, 2015), and equals 0 if the acquirer conduct the acquisition using focus strategy (same 4-digit industries).

We control country-level characteristics (Li and Qian, 2005) GDP per capita (ECON) and GDP growth (GROW). Number of employees, firm age, labour productivity and GDP per capita are in national logarithm (plus 1 since the logarithm is not defined for zero) (Majocchi and Strange, 2012). To control the performance difference due to unobserved country and industry difference, we control for country fixed effects and industry fixed effects by adding country and industry dummies. To compare the effects of acquisition type on the performance of targets (subsidiaries) who share the same acquirer (parent), we control for the parent fixed effects (Yang et al., 2014). We also include year fixed effect to control performance difference due to the different years (Yang and Kwong, 2013). Table 4.1 provides definitions and data sources of the variables employed in the empirical models.

5.4 Results

5.4.1 Descriptive Statistics

Tables 2 present descriptive statistics and correlation matrix. The sample consists of 520 parents and 657 affiliates, corresponding to 3,202 affiliate-parent-year observations and covering 45 countries (i.e., 39 home countries and 32 host countries). We find that, with respect to type of acquisition, 55% targets are involved in foreign acquisition, while the other 45% targets are involved in domestic acquisition. With

regard to the acquirer's location and multinationality, 15% acquirers are locating in developing countries. 49% affiliates are locating in overseas countries. With respect to accounting information, the TFP has an average of 5.59. A firm, on average, has labour force of around 4403 employees, labour productivity of 513.25 thousand US dollars and financial leverage of 83%. Right panel of table 4.2 shows that most correlation coefficients are low.

The data consists of 45 economies, including many OECD countries. Table 4.7 (in Appendix A) describes the country diversity of our dataset, along with key variables for multinational acquirers and targets, including TFP, FORA, MULT, DEDA and among others (See Appendix A, Table A3). Unsurprisingly, the majority of the parents can be found in developed countries. The top seven countries, in terms of number of acquirers, are the U.S., Japan, the U.K., Germany, Netherlands and Sweden, corresponding to 59.23 per cent of all acquirers. The subsidiaries are concentrated on some developed countries and the largest developing countries, with large numbers in U.K., Japan, Germany, China, Russia, Poland, Taiwan (China), Greece, Brazil, Lithuania, the U.S., Turkey, South Korea, France and India, accounting for 87.21 per cent of all targets in our sample.

5.4.2 Regression Results

Our paper employs multiple regression models with fixed effects estimators, following prior study (Yang et al., 2014). Our regression models include year fixed effect, industry fixed effect, country fixed effect and parent fixed effect. Table 4.3 shows the main estimates. There are 3,202 observations in the full sample. The F-statistics are significant across all models, suggesting all models are statistically significant. The adjusted R squared is about 91%, indicating that 91% of the variance of target firm's performance total factor productivity (PERF) can be explained by these models. All controls are significant and have the expected signs. The number of employees (SIZE) and labour productivity (PROD) have significant positive signs, suggesting that larger firms or firms with more productive labour have better performance.

However, the leverage (LEV) has a negative coefficient, suggesting more debts and less equity are detrimental to firm performance.

Now let's turn to our key variable foreign acquisition, which is the measure of acquisition type. As expected, we find (from column 1) that the foreign acquisition (FORA) has a significant positive coefficient 0.2494, suggesting foreign acquisition has a positive effect on target's performance when comparing domestic acquisition. This may be because, relative to domestic acquirer, that foreign acquirers have strong ownership-specific advantage and can bring advanced know-how, brand and managerial capability to the target, leading to the increase productivity of the target. The performance enhancement incurred by acquisition is larger when the acquirer is foreign rather than domestic. This result supports hypothesis 1. This suggested that the target's performance benefits from foreign owner's investment, when controlling for parent fixed effect, year fixed effect, the difference in target firm's number of employees, leverage and labour productivity.

Columns 3 presents the results for the moderating effects of acquirer's country of origin. It shows that the interaction term (FORA $\times$ DEDA) between foreign acquisition and acquirer's country of origin is significantly positive, suggesting that acquirer's location (developed country) positively moderates the relationship between acquisition type (foreign/domestic) and target firm's performance. This supports hypothesis 2. The positive effect of foreign acquisition is strengthened when the acquirer is locating in developed country. Developing country has a lack of advanced technological resource, partly due to the weak institution and poor intellectual property right protection. In contrast, developed countries are usually the technological frontier and have advanced technology development. Thus, compared with developing country acquirer, the foreign acquirer based in developed country could transfer more knowledge to the target, improve the target's productivity. This suggests the importance of home country effects.

We find from column 4 that the interaction term (FORA $\times$ MULT) between foreign acquisition involvement and acquirer's multinationality is significantly posi-

tive, suggesting that acquirer's multinationality positively moderate the relationship between acquisition type and target firm's performance. This supports hypothesis 3. The positive effect of foreign acquisition involvement is strengthened when the parent has more involvement in foreign operation. The reason might be that the benefit of multinationality such as owning more foreign knowledge can help firm better incorporate the acquired subsidiary into the entire organisation, and help transfer acquirer's knowledge to target firm.

As an additional analysis, we also explore the impact of institutional distance between home and host country on target firm's performance. Column 2 of Table 4.4 shows that the interaction term (FORA $\times$ INSD) between foreign acquisition and institutional distance is significantly negative, suggesting that institutional distance negatively moderate the relationship between acquisition type (foreign/domestic) and target firm's performance. The difference between home and host country matters for target company performance. The reason might be that institutional distance between acquirer's and target's countries hinders the transfer of knowledge-based firm-specific advantage across the national border. The foreign target firm performance worse than the domestic target firm when the institutional distance is large.

5.5 Discussion and Conclusions

The existing literature of foreign acquisition premium mainly focuses on assessing the acquirer's performance, particularly short-term performance such as stock price (Haleblian et al., 2009): few papers focus on the target firm's performance. While the acquirer, on average, benefits from the acquisition, the evidence of the target firm is much more controversial. Some studies find positive effects of foreign acquisition on target firm's performance (Maksimovic et al., 2011), while some find negative ones (Harris and Robinson, 2002). In addition, the extant literature mostly only compares the performance of foreign and domestic acquisitions, ignoring potentially important moderators (Bertrand and Zitouna, 2008; Geluebcke, 2015). Further,

prior studies are mostly single or two countries studies (Chen, 2011; Bertrand and Betschinger, 2012; Bebenroth and Hemmert, 2015). We attempt to fill these gaps and provide a better understanding of foreign acquisition behaviour by analysing an (Mergers & Acquisitions) M&A dataset with large country coverage.

We argue that the positive effect of acquisition on target firm's performance is higher when the acquisition is made by a foreign acquirer rather than a domestic acquirer. We further argue that this effect is moderated by the acquirer's characteristics, including their location and multinationality. To be specific, we hypothesise that an acquirer's country of origin positively moderates the relationship between acquisition type and target firm performance. In other words, the positive effect of foreign acquisition is strengthened for the target whose acquirer is locating in a developed country. Similarly, we hypothesise that acquirer's multinationality with targets positively moderates the positive effect of acquisition type (foreign/domestic) on a target's performance. We test our hypotheses using panel data of 3,202 firm-year observations with a coverage of 45 countries between 2004 and 2013; we find evidence to support all hypotheses.

This paper makes four contributions. First, our study particular focuses on target firm's performance, while previous studies mainly focus on the acquirer's performance. The acquirer's performance, on average, enhances after acquisition due to the exploitation of firm-specific capabilities in the overseas market; however, the performance outcome for the target is not so straightforward and needs more research. Second, the few prior studies on target firm's performance provide mixed findings, mainly due to the country contexts of different samples, which in most cases consists of single or two countries. We use a much larger country coverage of 45 economies, and aim to provide a better understanding of foreign acquisition premium. The results show that the acquirer's nationality plays a vital role on a target firm's performance, particularly considering foreign and domestic acquirers. More specifically, compared with domestic acquisition, foreign acquisition can provide larger improvement on a target firm's performance. Internalisation theory

attributes this to the exploitation of parent's ownership-specific advantage in its overseas subsidiary. We extend this argument to the acquisition performance. The more productive acquirer transfers knowledge-based firm-specific advantage (FSA) such as know-how and technology to the target after acquisition. This helps to enhance the target firm's performance, particularly productivity. This casts doubt on some country's policies that discriminate against foreign acquisition and set high barriers for the approval of foreign acquisitions.

Third, we make a theoretical contribution to the literature. We find that the relationship between acquisition type (foreign/domestic) and performance is contingent on the acquirer's characteristics, including their location and multinationality. We contribute to the location literature and provide evidence that an acquirer's country of origin matters. Compared with a developing country acquirer, we find that a developed country acquirer can offer more benefits to a target firm's performance. The success of the target depends on the economic development of the acquirer's home country, particularly considering the comparison between developed and developing country. We argue that the transfer of knowledge-based FSA, which benefits target firms' performance, is stronger when the acquirer comes from a developed country and weakened when the acquirer comes from a developing country. This may be because conventional knowledge transfer is more likely to happen in developed country MNEs, who desire to exploit its strong intangible assets in overseas markets (Dunning, 2001), while reverse knowledge transfer is more likely to happen in the developing country MNEs who seek foreign strategic assets to enhance its performance in the home market (Makino et al., 2002; Luo and Tung, 2007). Likewise, we find that an acquirer's multinationality has positive moderating effects on the acquisition type-performance relationship, respectively. MNEs with high multinationality have strong capability in incorporating the target into the organisation and transferring the headquarters' knowledge to the target to enhance the target's competitiveness in the local market (Uhlenbruck, 2004).

Four, we make an empirical contribution by examining the effects of acquirer's

characteristics on a target's performance, measured by total factor productivity, based on a large country coverage of 45 economies corresponding to 3,202 firm-year observations between 2004 and 2013. Such data are made available by combining the firm-level Orbis database and deal-level Zephyr database, while previous acquisition research mainly relies on an acquisition database like Zephyr, which provides limited information of the acquirer's characteristics such as multinationality.

This paper has some limitations. First, acquisition is vital strategy made by firms. Perhaps more productive firms are selected as the targets and acquired by acquirers. This potential endogenous issue should be alleviated or eliminated. Second, motivation plays an important role in the acquisition performance. Knowledge exploiting and knowledge seeking acquisition, corresponding to conventional and reverse knowledge transfer respectively, lead to a rather different performance outcome on the target firm. The identification of motivations in most studies relies on the interpretation of data. However, we still do not know the real motivations of managers who make acquisition decisions. One possible way to know these motivations is to survey the managers. We leave these topics for future research.

5.6 Tables and Figures

Figure 5.1: The Research Model

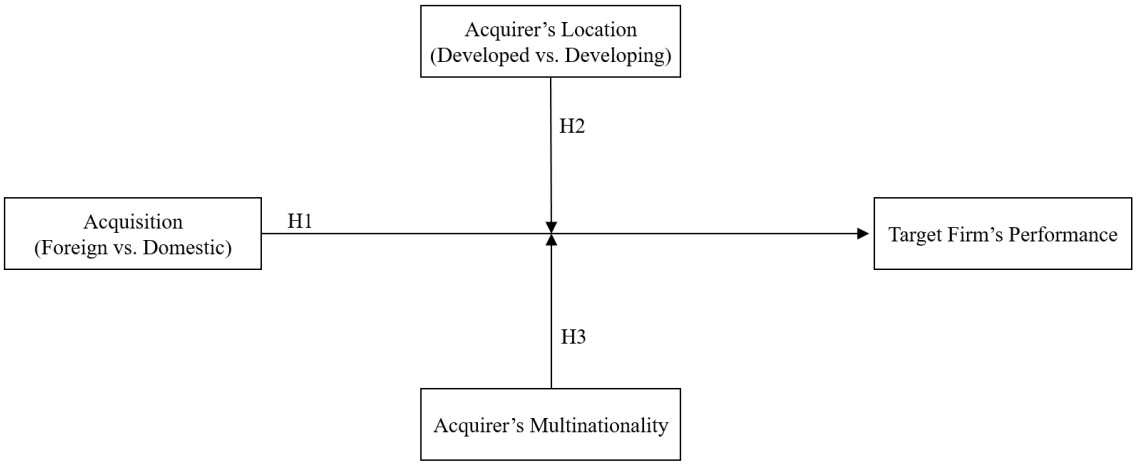


Table 5.1: Operationalization of Variables

Variable	**Operationalisation**	**Source**
PERF	The natural logarithm of the target's total factor productivity (TFP)	Orbis
FORA	Foreign acquisition: Equal to 1 (0) if the acquirer is in foreign (domestic) country	Orbis
MULT	The ratio of the acquirer's number of overseas subsidiaries to total number of subsidiaries	Orbis
DEDA	Developed country acquirer: Equal to 1 (0) if the acquirer locates in developed (developing) country	Orbis
SIZE	The natural logarithm of the target's number of employees	Orbis
LEV	The target's debt to equity ratio	Orbis
PROD	The natural logarithm of the target's sales divided by the target's number of employees (US$)	Orbis
AGE	The duration of the existence of a firm since the start-up year	Orbis
DIV	Diversification acquisition: Equal to 1 (0) if the acquirer operates in an industry (4-digit) different from the target	Orbis
ECON	The natural logarithm of the host country's GDP per capita (US$)	WDI
GROW	The host country's GDP growth (%)	WDI

Table 5.2: Descriptive Statistics and Correlations Matrix

	Variable	Mean	Std. Dev	1	2	3	4	5	6	7	8	9	10	11
1.	PERF	5.59	0.50	1.00										
2.	FORA	0.55	0.50	-0.09	1.00									
3.	DEDA	0.85	0.36	0.05	0.24	1.00								
4.	MULT	0.49	0.28	-0.06	0.56	0.20	1.00							
5.	SIZE	6.35	1.92	0.36	-0.31	-0.20	-0.22	1.00						
6.	LEV	0.83	1.13	0.01	-0.02	0.03	-0.02	0.10	1.00					
7.	PROD	12.59	1.00	0.55	-0.09	0.14	-0.12	-0.05	0.07	1.00				
8.	AGE	3.11	0.83	0.20	-0.26	0.11	-0.16	0.35	0.06	0.09	1.00			
9.	DIV	0.74	0.44	-0.06	0.00	0.02	-0.02	-0.22	-0.04	-0.01	-0.04	1.00		
10.	ECON	10.05	0.86	0.10	-0.07	0.38	-0.05	-0.25	0.11	0.18	0.15	0.14	1.00	
11.	GROW	2.25	4.41	-0.01	0.07	-0.27	0.04	0.16	-0.09	-0.08	-0.15	-0.06	-0.50	1.00

Notes: All correlation coefficients above 0.10 is significant at over 10% level.

Table 5.3: Acquisition Type and Performance: the Role of Location and Multinationality

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
FORA		0.2494***	-0.0921	0.0196
		(0.079)	(0.160)	(0.137)
FORA × DEDA			0.3660**	
			(0.155)	
FORA × MULT				0.4100**
				(0.181)
SIZE	0.2003***	0.2044***	0.2042***	0.2047***
	(0.008)	(0.008)	(0.008)	(0.008)
LEV	-0.0418***	-0.0410***	-0.0406***	-0.0407***
	(0.004)	(0.004)	(0.004)	(0.004)
PROD	0.4151***	0.4175***	0.4164***	0.4177***
	(0.012)	(0.012)	(0.012)	(0.012)
AGE	-0.0174	-0.0166	-0.0197	-0.0169
	(0.018)	(0.018)	(0.018)	(0.018)
DIV	0.0779***	0.0934***	0.0934***	0.0913***
	(0.029)	(0.030)	(0.030)	(0.030)
ECON	-0.0284	-0.0353	-0.0322	-0.0364
	(0.024)	(0.024)	(0.024)	(0.024)
GROW	0.0001	0.0001	0.0001	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
Affiliate Country FE	X	X	X	X
Affiliate Sector FE	X	X	X	X
Year FE	X	X	X	X
Parent FE	X	X	X	X
Adj R-squared	0.910	0.910	0.910	0.910
No. observation	3202	3202	3202	3202
F statistics	200.811	195.210	238.814	196.148

Notes: The dependent variable is target firm's TFP. All monetary variables are in natural logarithm. Values in the parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 5.4: Additional Analysis: the Role of Institutional Distance

	(1) Model 1	(2) Model 2
FORA	0.2494***	0.2478***
	(0.079)	(0.080)
FORA × INSD		-0.1587**
		(0.068)
SIZE	0.2044***	0.2045***
	(0.008)	(0.008)
LEV	-0.0410***	-0.0408***
	(0.004)	(0.004)
PROD	0.4175***	0.4169***
	(0.012)	(0.012)
AGE	-0.0166	-0.0177
	(0.018)	(0.018)
DIV	0.0934***	0.0928***
	(0.030)	(0.030)
ECON	-0.0353	-0.0168
	(0.024)	(0.024)
GROW	0.0001	0.0003
	(0.001)	(0.001)
Affiliate Country FE	X	X
Affiliate Sector FE	X	X
Year FE	X	X
Parent FE	X	X
Adj R-squared	0.910	0.911
No. observation	3202	3202
F statistics	195.210	186.219

Notes: The dependent variable is target firm's TFP. INSD refers to institutional distance. All monetary variables are in natural logarithm. Values in the parentheses are robust standard errors. Significance levels: *0.1; **0.05; ***0.01.

Table 5.5: Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature)

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
1	(Conn and Connell, 1990)	73 acquisitions between US firms (35 US acquirers) and UK firms (38 UK acquirers) from 1971 to 1980, WSJ index, (CRSP), London Share Price Database (LSPD)	Cumulative abnormal returns of the target firm	Not specified	Event study methodology, Not specified	Cumulative abnormal returns for UK target firms were about half that for US target firms at the announcement month.
2	(Cakici et al., 1991)	245 foreign acquisitions in the US from 1982 to 1987. Center for Research in Security Prices (CRSP) NYSE-AMEX, CRSP NASDAQ, Roster of Mergers and Acquisitions, W.T. Grimm's Mergerstat Review, WSJ index	Average standard abnormal return (SAR) of target firm	Not specified	Event study methodology, Not specified	Foreign acquisition generates abnormal returns to targets, which is not much higher than domestic acquisition. Foreign acquisition generates sell-off abnormal returns to vendors, which is substantially higher than domestic acquisition.
3	(Harris and Ravenscraft, 1991)	1273 US target firms (1114 domestic acquisitions and 159 foreign acquisitions) from 1970 to 1987, Wall Street Journal (WSJ) index, Who Owns Whom, Commercial Clearing House Capital Changes Reporter	Cumulative abnormal returns of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer	GLS regression: Control variables: Cash or not, Multiple bidders, Prior operation experience in target's country, Industry relatedness, R&D intensity, Total selling (including advertising) expense intensity, Exchange rate (the proportionate deviation of the home currency in the acquisition year), Tax reform (1 if after the specific tax act was in effect).	Foreign acquisition premium exists. Foreign acquisition has stronger performance gain with respect to target's wealth gain. Acquirer' experience and industry relatedness does not moderate the relationship.
4	(Cebenoyan et al., 1992)	73 foreign acquisitions and 134 domestic acquisitions in the US from 1978 to 1987. Roster of Mergers and Acquisitions, W.T. Grimm's Mergerstat Review, WSJ index	Cumulative abnormal returns of the target shareholder	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer	Cross-sectional regression, Control variables: Cash or not, Multiple bidders, Tax reform (1 if after the specific tax act was in effect), Hi-tech (dummy), Target is in secondary sector (dummy)	Foreign acquisition has stronger performance gain with respect to target shareholder's wealth gain.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
5	(Swenson, 1993)	226 foreign acquisitions and 477 domestic acquisitions in the US from 1974 to 1990, Mergers and Acquisitions, Mergerstat Review, WSJ, Center for Research in Security Prices (CRSP)	Cumulative abnormal returns of the target shareholder	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer	Event study methodology, Cross-sectional regression. Control variables: Cash or not, Manufacturing industries, Government challenge, Moderating variables: Weak-dollar years, Foreign exchange rate, Future exchange rate, Multiple bidders, Relative intangibles, Relative market	Foreign acquisition has stronger performance gain with respect to target shareholder's wealth gain. Weak-dollar years, foreign exchange rate, future exchange rate, multiple bidders and relative intangibles moderates the relationship.
6	(Markides and Ittner, 1994)	276 foreign acquisitions made by US firms from 1975 to 1988, WSJ index, CRSP, Compustat, Trinet tapes	Cumulative abnormal returns of the acquiring firm	Not specified	Event study methodology, OLS regression: Control variables: R&D intensity, advertising intensity, four-firm concentration ratio Acquisition: Industry relatedness (2-digit),, equity stake (1 is partly controlling acquisition), Cash or not, Size (target sales/acquirer sales), Tax reform, Strength of US dollars, Stock market crash, Acquiring firm: Prior international experience, Acquirer income, Acquirer ROS, Acquirer size (sales), Target country's English-speaking status, relative GDP growth, stock market correlation, relative inflation, relative hourly wages, cultural distance (Hofstede), country dummies	Foreign acquisition has performance gain with respect to acquirer's wealth gain. The wealth gain is a affected by the industry relatedness, concentration level, advertising intensity, prior international experience, profitability, tax reform and currency strength. For instance, international experience has positive impact on acquirer firm's wealth gain.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
7	(Cheng and Chan, 1995)	219 acquisitions in the US from 1981 to 1987, Mergerstat Review, CRSP, WSJ index	Cumulative abnormal returns of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer	OLS regression, ANOVA, Control variables: Sales, Deal size, Tender offer or merger, Industry relatedness.	Foreign acquisition has stronger performance gain with respect to target's wealth gain. When comparing the two locations, UK acquirers pay significantly lower price premium to US targets than non-UK countries.
8	(Datta and Puia, 1995)	112 foreign acquisition by US firms from 1978 to 1990	Cumulative abnormal returns of the acquiring firm	Not specified	Event study methodology Control variables: Not specified, Moderating variables: Acquisition relatedness (related if horizontal or vertical acquisition, otherwise unrelated), Cultural fit (cultural distance)	Foreign acquisition does not create value for the shareholder of foreign acquirer. Acquisition relatedness's effect on value creation is unclear. Acquisition with large cultural distance has a lower wealth effect for the acquirer.
9	(Dewenter, 1995)	90 foreign acquisitions and 294 domestic acquisitions in the US from 1978 to 1989. Roster of Mergers and Acquisitions, W.T. Grimm's Mergerstat Review, WSJ index, F&S Predicasts, Commerce Department FDI in the US Transaction Lists, Japan's Economic Institute, Compustat,	Cumulative abnormal returns of the target shareholder	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer	Weighted least squares (WLS) regressions, Control variables: Not specified, Moderating variables: Tax reform (1 if after the specific tax act was in effect), Hostile transactions (1 if management or shareholders take any action to delay or stop the bid), Multiple bidders (dummy), Purchase by using equity (dummy), Foreign exchange rate	Foreign acquisition does not have stronger performance gain with respect to target's wealth gain. Hostile transactions and multiple bidders moderate the relationship.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
10	(Eun et al., 1996)	225 foreign acquisitions in the US from 1979 to 1990, Mergers and Acquisitions, WSJ index, CRSP, Financial Post Stock, Corporate and Dividend databases, North American stock (NASTOCK), International Securities Information database (EXSHARE), Compustat	Standardised cumulative abnormal returns of the target firm and acquirer firm	Not specified	Event study methodology, Cross-sectional regression, Control variables: Foreign country dummies, Relative value (target's value/acquirer's value), R&D intensity of acquirer, R&D intensity of target, Industry relatedness, Multiple bidders (dummy), Foreign exchange rate, Deal size, Tendered (dummy),	Foreign acquirers and Targets experience significantly positive combined wealth gains. Foreign acquirers benefitted from the targets' R&D capabilities.
11	(Weber et al., 1996)	8 foreign acquisitions and 8 domestic acquisitions in US firms from 1985 to 1987, Journal of Mergers & Acquisitions, Questionnaire	National and corporate cultural fit in foreign and domestic acquisitions	National culture differential (Hofstede, 1980), Corporate culture differential, Autonomy removal, stress, Attitudes toward cooperating with other top management team, Group attitude toward new organization, Commitment, Cooperation	Coplot method, Control variables: Not specified	In foreign acquisitions, compared with corporate culture differentials, national cultural differentials better predict stress, negative attitudes toward the merger, and actual cooperation,
12	(Seth et al., 2002)	100 foreign acquisitions by US firms from 1981 to 1990, Mergers & Acquisitions Rosters, W.T. Grimm's Mergerstat Review, S&P Daily Stock Guide, Moody's International Manual and Predicast, International Financial Statistics	Cumulative abnormal returns of combined firm (target and acquirer) and the acquirer firm	Synergistic: Reverse internalization (target's R&D, Advertising, marketing intensity), Relative size (target size/acquirer size), Market seeking (dummy, relative GDP growth of the target country), financial diversification (reduction in the returns variability), Managerialist: Empire building (relative size), Risk reduction (financial diversification)	Event study methodology, OLS regression: Control variables: Market-oriented system, Group-oriented system, Bank-oriented system, Multiple bidders	Foreign acquisition premium could be different by the acquisition motives (synergistic, managerialist, hubristic). Synergistic acquisition is associated with value creation. Managerialist acquisition is associated with value destruction.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
13	(Aw and Chatterjee, 2004)	156 UK firms from 1991 to 1996, Rosters section of Mergers & Acquisitions: The Dealmaker's Journal	Cumulative abnormal returns of the acquiring firm	Not specified	Event study methodology, Control variables: Not specified	Domestic acquisition has stronger performance gain with respect to acquirer's post-takeover performance. Compared post-acquisition performance of three locations, including UK, US and Continental European targets.
14	(Danbolt, 2004)	116 foreign acquisitions and 514 domestic acquisitions in the UK from 1986 to 1991. Acquisition monthly, Datastream, Financial Times	Cumulative abnormal returns of the target firm and acquirer firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer	Event study methodology, OLS regression, Control variables: Cash or not, Hostile acquisition (dummy), Multiple bidders (dummy), Bid revision (dummy), Successful bid outcome (dummy), Industry dummies, Industry relatedness, Pre-bid stake, Size (pre-bid market value of the target)	Foreign acquisition does not have stronger performance gain with respect to target's wealth gain, after controlling for firm and bid characteristics.
15	(Conn et al., 2005)	4344 acquisitions in the UK from 1984 to 1998.	Cumulative abnormal returns of the acquiring firm	Not specified	Event study methodology, Multiple regression, Control variables: Noncash (dummy), Relative size (deal size/acquirer size), Acquirer value/glamour (1 if acquirer's market-to-book value is in quintile one/five), Hi-tech sector, Subsidiary target, Industry relatedness (2 digit), Acquirer size (market value)	Relative to domestic acquisition, foreign acquisition is associated with lower stock returns (announcement, long run).

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
16	(Moeller and Schlingemann, 2005)	383 foreign acquisition and 4047 domestic takeover transaction from 1985 to 1995	Stock performance (cumulative abnormal return), operating performance (industry adjusted operating cash flow) of the acquiring firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	Event study methodology, OLS regression. Control variables: Change in international diversification, Change in product diversification, Tender offer, Conglomerate, Hostile, Multiple bidders, Private/public status, Subsidiary target, Relative size (deal size/value of assets), Cash in payment (cash payment/deal size), Equity in payment (equity payment/deal size), Market-to-book value, Free cash flow, Moderating variables: Strong Federal Reserve Dollar Index	Domestic acquisition has stronger performance gain with respect to acquirer shareholder's wealth gain, and results in larger changes in operating performance.
17	(Martynova and Renneboog, 2006)	2419 acquisitions from 28 European countries from 1993 to 2001. M&A database of the Securities Data Companies (SDC)	Cumulative average abnormal returns of the target firm and acquirer firm	Not specified	Univariate analysis, Moderating variables: Hostile takeovers, Means of payment (cash, equity, mixed), Industry relatedness, Private/public status	Domestic acquisition has stronger performance gain with respect to target shareholder's wealth gain. Targets experience significantly positive wealth gains (9%), while foreign acquirer has smaller but significant wealth gain (0.5%). Hostile takeovers, means of payment, industry relatedness and private/public status affect the relationship.
18	(Bertrand and Zitouna, 2008)	371 foreign and domestic acquisition on French firms (1993-2000)	TFP	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	PSM, DID	Foreign acquisition has stronger efficiency gain.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	Sampling and Data Sources	Measures of Performance	Measures of Acquisition	Explanatory Variables	Findings
19	(Aybar and Ficici, 2009)	58 emerging economy MNEs (retrieved from World Investment Report) from 13 countries with 433 acquisitions from 1991 to 2004, Thomson SDC Platinum database, DataStream	Cumulative abnormal returns of the acquiring firm	Not specified	Event study methodology, Cross-sectional regression: Size (assets), Industry relatedness (4 digit), Target status (privately owned vs. publicly owned), Ownership mode, Investment size (deal size/acquirer's value), Institution (World Economic Freedom Index; Developed countries), Proximity (combines cultural and geographical distance; only Hofstede's cultural dimensions), International experience, Prior operation experience in target's country, Hi-tech (dummy), Corporate governance, Structure (1 if the firm issued Level II or III ADRs), Diversified (dummy), Region dummies	Foreign acquisition does not create value, but point to value destruction for more than half of the analysed acquisition. International experience sometimes has significant negative impact on acquirer's value. Prior operation experience has insignificant effect on acquirer's value.
20	(Balsvik and Haller, 2010)	65740 observations in Norway from 7158 plants from 1992 to 2004.	Employment, labour productivity, TFP, wage of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	OLS, OLS FE, Control variables: Firm age, Plant size (employees), Year dummies, Industry dummies, Year-industry (3-digit) interaction dummies	Target firms acquired by foreign acquirer are associated with larger size, higher wage, higher productivity.
21	(Chen, 2011)	2074 acquisitions (19792006)	Labour productivity, sales, employment, ROA	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	PSM, DID	Relative to domestic acquisition, foreign acquisition tends to enhance target firm's employment and sales.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
22	(Bertrand and Betschinger, 2012)	More than 600 acquirers in Russia from 1999 to 2008	EBIT normalized with assets of the acquiring firm	Number of foreign acquisitions, number of domestic acquisition, serial acquirer (>=2 or >=4): foreign/domestic acquisition count, single acquirer (=1 or <4): foreign/domestic acquisition count	OLS, panel least squares, System GMM, PSM	Both foreign and domestic acquisitions reduce the acquiring firms' performance.
23	(Claessens and Van Horen, 2012)	7322 bank-year observations from 51 countries (19992006)	ROA	Dummy equals to 1 if the bank is owned by foreign owner, equals to 0 if owned by domestic owner.	Dummy, OLS, Control variables: Market share (assets based), Loan/assets, Leverage (equity/assets), ROA volatility (Standard deviation o ROA in 8-year), Loan growth, (Deposit + short-term funding)/liabilities, State owned, Problem bank (exit within 4 years after entry), Age (and its squared)	Foreign bank performs better than domestic bank.
24	(Kohli and Mann, 2012)	202 foreign acquisitions and 66 domestic acquisitions	Cumulative abnormal returns of the acquirer firms	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer	Event study methodology, Cross-sectional regression, FGLS weighted least square regression, Control variables: Cash or not, Industry relatedness, Multiple bidders, Relative size (deal size/(deal size + acquirer value)), Acquirer value, Hi-tech sector	Foreign acquisition has stronger performance gain with respect to target's wealth gain. In cross-sectional regression, technology moderates the relationship.
25	(Stiebale, 2013)	389 foreign acquisitions and 324 firms in Germany from 2002 to 2007	R&D intensity of the acquiring firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	IV	Foreign acquisition is associated with larger domestic expenditures of R&D.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	Sampling and Data Sources	Measures of Performance	Measures of Acquisition	Explanatory Variables	Findings
26	(Bandick et al., 2014)	All manufacturing firms in Sweden from 1993 to 2002	R&D intensity of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if there is no foreign acquisition during the sample period.	OLS, PSM, DID, Control variables: Year dummies, Industry dummies (3-digit),	Foreign acquisition is associated with increasing R&D intensity in target firm.
27	(Bauer and Matzler, 2014)	106 firms in Central Europe (Austria, Germany and Switzerland) in 2010, Survey, Zephyr, World Competitiveness Yearbooks	Manager's rating (M&A success, 7-point Likert scale)	5 or 7 point scale: Strategic complementarity, Cultural compatibility, Degree of integration, Speed of integration,	PLS analysis, Transaction type, Relative size, Industry growth, Institutional distance	Positive relationship cultural fit has with M&A success. Negative relationship cultural fit has with speed and degree of integration.
28	(Ning et al., 2014)	335 foreign acquisitions of 137 China's acquirer firms listed in Hong Kong from 1991 to 2010, Thomson, DataStream	Cumulative average abnormal returns of the acquirer firm	Not specified	Event study methodology, Cross-sectional regression. Control variables: Firm age, Firm size, Tobin's q, Leverage, ROA, ROS, Group affiliation, Public target, Targets' regions, Stock payment, Cash payment, Moderating variables: Largest shareholder, Other blockholders, Institutional investors, Stated owned, Foreign owned, Corporate founder owned, Board size, Board independence, CEO/chairman Duality, Supervisory board size, Audit committee independence, Audit fees	Foreign acquisition has performance gain with respect to acquirer's wealth gain.
29	(Rani et al., 2014)	268 domestic and 255 foreign acquisitions from 2003 to 2008	Average abnormal returns, cumulative average abnormal returns of the acquiring firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	Event study methodology	Relative to domestic acquisition, foreign acquisition is associated with higher returns.

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
30	(Bebenroth and Hemmert, 2015)	47 firms in Japan and 62 firms in Korea from 2005 to 2010	ROA development (difference between three-year average ROA acquisition and three-year average ROA after acquisition), assets growth of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer in emerging markets, equals to 0 if acquired by foreign acquirer in developed markets	OLS regression, Control variables: Target firm age, Size (employees), Industry relatedness (same-industry dummy), Year dummies, Industries dummies	Target firms acquired by foreign acquirer in emerging market have higher ROA development and lower assets growth.
31	(Geluebcke, 2015)	Germany firms from 2007 to 2009	TFP	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	PSM, DID	Foreign acquisition has negative impact on employment and no impact on productivity.
32	(Kamal, 2015)	1493 OECD acquired and 1813 Hong Kong, Macao and Taiwan (HMT) acquired firms in China from 1999 to 2004, China's National Bureau of Statisticsc (NBS)	TFP, labour productivity, wage, profit, capital per worker of the target firm	PSM, DID, Dummy equals to 1 if the target is acquired by OECD acquirer, equals to 0 if acquired by HMT acquirer.	Control variables: Sales, Capital, Wage per worker, Age, Export Intensity, State equity share	Relative to HMT acquired firms, OECD acquired firms have higher TFP, wage, profits, capital intensity. No significant statistical difference for output, employment.
33	(Wang and Wang, 2015)	125000 firm-level observations from 2000 to 2007	TFP, gross output per worker, value added output per worker, leverage ratio, liquidity ratio and export share of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	PSM, DID	Though foreign and domestic acquisition both improve target's productivity, foreign acquisition didn't bring additional gain on target's productivity. Foreign acquisition also enhances target firm's output, employment and wages.
34	(Aaron, 2016)	38 US firms, Thomson Reuters M&D database, Company annual report	ROA, ROE	Dummy equals to 1 for 3 years before the target is acquired by foreign acquirer, equals to 0 for 3 years after the target is acquired by foreign acquirer.	OLS, Event study: Control variables: Size (+), Debt (+), Management decisions, Organisational culture, Economic climate, Operation integration	Not significant relationship

Summary of 38 Empirical Studies (Foreign Acquisition-Performance Literature) [Cont's]

	Empirical Studies	**Sampling and Data Sources**	**Measures of Performance**	**Measures of Acquisition**	**Explanatory Variables**	**Findings**
35	(Bamiatzi et al., 2016)	120000 firm-level observations in Italy and Spain from 2002 to 2010	Gearing, short-term leverage of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	PSM	Compared with domestic acquisition, foreign acquisition brings additional reduction on target's debt level. mitigating the failure risk and enhancing the survival.
36	(Galavotti et al., 2017)	689 acquisitions by 464 acquirers from 60 countries. Orbis, Zephyr, World Economic Forum	Degree of product relatedness between acquirer and target (Ordinal variables: 0 to 6)	Foreign acquisition for re-entry (1 if foreign acquirer has previous entry in the target's country), Foreign acquisition for entry (1 if foreign acquirer does not have previous entry in the target's country)	Ordered logistic regression, Control variables: Acquisition experience, Performance (t-1), Acquirer size, Deal size, Stage of development, Foreign ownership, Intensity of local competition, Market size, Government efficiency, Industry dummies, Year Dummies	Positive relationship
37	(Liu et al., 2017)	775 cases and 4114 observations in China from 1998 to 2007	TFP, sales, fixed asset investment of the target firm	Dummy equals to 1 if the target is acquired by foreign acquirer, equals to 0 if acquired by domestic acquirer.	OLS, PSM, DID, Firm age (and its squared term), Employees, Assets, Capital stock/employees, Asset/liability, Exporter, Foreign control, State control	Foreign acquisition increases target firm's TFP, sales, fixed asset investment.
38	(Shaban and James, 2017)	19 acquisitions in Indonesian banks from 2005 to 2012, Bankscope, Zephyr	Cost efficiency score (or rank), profit efficiency score (rank), net interest margin, ROA, ROE, total cost to total revenue, cost-income ratio of the target firm	Dummy equals to 1 if the target is acquired at least one time by foreign acquirer, equals to 0 if there is no foreign acquisition during the sample period.	OLS, Control variables: Listed firm (dummy), Industry relatedness, Liquid assets/total assets, Size (assets), Market share	Regional foreign acquirer increases target's performance. Non-regional foreign acquirer reduces target's risk exposure. Domestic acquirer decreases target's efficiency.

Notes: M&A refers to Merger & Acquisition.

Table 5.6: Key Issues in Foreign Acquisition Literature

Issue	**Main alternatives**	**Recommendations**
Unit of analysis	Deal-level, Firm-level	Firm-level
Motivations of acquisition	International risk diversification, market access, Exchange rate effects, Managerialist acquisitions, Favourable tax treatment for foreign acquirer, Goodwill accounting treatment, Economies of scale, Exploit firm-specific assets (e.g., superior management technique), Capability procurements, Speed up entry, Avoid adding new capacities and thus escalating rivalry with incumbents, Imperfections and costs in product, factor and capital markets, Biases in government and regulatory policies, Synergistic gains, Product diversification	Incorporate important motives in empirical model
Measures of performance	Accounting performance (ROA, ROE, ROS, EBITOA), Market performance (Cumulative abnormal returns), TFP	TFP
Measures of acquisition type	Foreign acquisition (dummy), Before and after acquisition (dummy)	Foreign acquisition (dummy)
Estimation method	OLS, OLS FE/RE, Event study methodology, GLS, ANOVA, Hierarchical regressions	Depends on data availability, OLS
Functional form	Linear	Linear
Time lags	Concurrent measures of diversification and performance	Discuss the possible lags
Control variables	Deal level: Cash or not, Multiple bidders, Prior experience in target's country, R&D intensity, Total selling (including advertising) expense intensity, Exchange rate (the proportionate deviation of the home currency in the acquisition year), Tax reform (1 if after the specific tax act was in effect), Successful bid outcome, Subsidiary target Firm-level:, Acquirer size (market value), Leverage, R&D intensity, Advertising intensity, Age, Firm dummies. Industry-level: Industry relatedness (2-4 digit), Industry profitability, Industry growth, Industry dummies, Hi-tech sector, Manufacturing sector, Industry dummies Country-level: Country dummies, GDP growth, Country dummies Dyadic-level: Institutional distance, Relative size (deal size/acquirer size) Year-level: Year dummies	Size, Leverage, Sales per worker, GDP growth, GDP per capita

Key Issues in Foreign Acquisition Literature [Cont's]

Issue	**Main alternatives**	**Recommendations**
Moderating variables	International experience, Technology, Hostile takeovers, cultural fit (cultural distance), Means of payment (cash, equity, mixed), Industry relatedness, Private/public status, Tax reform, Relative intangibles, Relative market, Foreign exchange rate, Future exchange rate, Multiple bidders, Stated owned, Board size, Board independence, CEO/chairman Duality, Supervisory board size, Audit committee independence, Audit fees, UK vs. non-UK acquirers, UK, US, Continental European	International experience (multinationality), Acquirer's location (developed vs. emerging economies)

Table 5.7: Key Variables by Economy

Country	N	MULT	N	PERF	FORA	DEDA	SIZE	LEV	PROD	AGE	DIV	ECON	GROW
	Acquirer		Target										
Australia	4	0.78											
Austria	8	0.62											
Belgium	8	0.79											
Brazil	2	0.24	15	5.67	0.87	0.87	4,765	1.26	717	27.00	0.47	10.78	4.43
Bulgaria	1	0.48											
Canada	1	0.94											
China	16	0.24	37	5.66	0.53	0.50	7,659	0.76	397	11.66	0.58	3.93	10.43
Colombia			4	5.40	1.00	1.00	1,830	0.46	772	72.62	0.26	5.29	4.82
Czech Republic	1	0.63	4	5.91	0.89	1.00	3,900	0.27	747	12.94	0.11	18.54	2.62
Denmark	7	0.86											
Estonia	6	0.28	7	5.34	0.77	0.95	1,126	0.39	211	16.05	0.51	14.60	3.32
Finland	16	0.78											
France			9	5.51	1.00	1.00	25,506	0.88	671	40.26	0.61	41.20	0.89
Germany	37	0.55	42	5.78	0.62	0.98	19,569	1.00	477	44.87	0.73	41.88	1.34
Greece	16	0.31	24	5.45	0.16	1.00	870	1.24	590	28.75	0.73	26.77	-2.52
Hong Kong	8	0.65	7	5.73	0.42	0.77	10,968	0.75	300	49.06	0.61	32.62	3.85
Hungary	1	0.78	1	5.97	0.00	1.00	1,145	0.28	1,454	56.33	1.00	13.31	-0.18
India	8	0.69	7	5.82	0.84	0.84	4,149	0.30	735	43.52	0.56	1.26	7.22
Indonesia	2	0.31	6	5.55	0.70	0.70	8,391	0.69	207	23.17	0.17	3.08	5.86
Ireland	10	0.68											
Israel	6	0.26	4	5.49	0.44	1.00	2,602	1.83	362	21.00	1.00	31.07	3.78
Japan	89	0.37	109	5.83	0.02	0.99	4,610	0.92	695	54.47	0.74	40.98	0.46
Latvia	1	0.50	9	5.39	1.00	0.69	248	0.66	375	15.34	0.77	12.04	3.70
Lithuania	3	0.45	20	5.24	0.94	0.85	560	0.38	473	17.38	0.66	12.59	2.33
Luxembourg	2	0.95											

Key Variables by Economy [Cont's]

Country	N	MULT	N	PERF	FORA	DEDA	SIZE	LEV	PROD	AGE	DIV	ECON	GROW
Malaysia	9	0.52	4	5.50	0.10	0.10	17,389	0.23	127	29.86	0.52	7.38	5.22
Netherlands	24	0.84											
Norway	4	0.69											
Peru	1	0.13	3	5.63	0.67	0.67	1,355	0.71	391	21.00	1.00	3.01	7.07
Philippines	5	0.41	8	5.57	0.19	0.19	2,001	0.80	503	21.89	0.75	2.13	5.24
Poland	15	0.20	28	5.33	0.56	0.97	447	0.53	437	33.11	0.92	11.82	4.24
Romania			2	5.90	1.00	1.00	23,660	0.46	229	19.44	0.00	8.06	3.57
Russia	12	0.21	33	5.34	0.63	0.63	2,170	0.67	350	22.60	0.77	10.34	3.63
Singapore	6	0.50	1	5.63	0.00	1.00	3,547	0.55	381	31.50	1.00	52.43	7.45
Slovakia			1	6.22	1.00	1.00	3,821	0.12	1,306	16.38	1.00	15.84	4.27
South Africa	3	0.43	3	5.63	0.73	0.73	70,801	0.56	157	36.45	0.64	7.37	2.03
South Korea			12	5.36	1.00	0.84	402	0.29	671	12.25	0.81	21.33	3.83
Spain	8	0.51											
Sweden	20	0.70											
Taiwan	17	0.34	27	5.44	0.23	0.16	1,768	0.39	478	19.28	0.68	19.03	4.65
Thailand	2	0.39	3	5.85	0.33	0.00	2,874	0.44	525	21.00	0.67	3.56	4.59
Turkey	3	0.23	12	5.85	0.60	0.60	3,928	1.09	1,478	43.48	0.86	9.92	3.94
UK	50	0.42	202	5.55	0.82	0.93	1,136	0.96	378	21.44	0.83	41.44	0.99
US	88	0.59	12	5.69	0.36	1.00	4,155	0.70	930	17.13	0.73	48.12	1.45
Vietnam			1	6.21	1.00	1.00	1,000	1.36	41	16.00	1.00	1.37	6.02

Notes: N is the number of firms. All monetary variables are in thousands of US dollars. The sample covers 45 countries, including 32 host countries and 39 home countries, corresponding to 520 parents and 657 affiliates.

Chapter 6

Conclusions

6.1 Summary and Discussion

The past four decades have witnessed a growing body of literature on the relationship between diversification and firm performance. Nevertheless, there are mixed or even conflicting results. This is partly due to a lack of consideration of important variables such as geographic location and product relatedness. These research gaps are filled in this PhD thesis based on the analysis of the Orbis global database. This thesis finds that there is a significant positive relationship between multinationality and firm performance for emerging economy multinational enterprises. It helps to explain why, today, an increasing number of firms from emerging economies such as China and India, are making huge investments in foreign countries through FDI. Drawing on more than 12,000 firms from 63 economies, this PhD thesis also finds that there is a U-shaped relationship between product diversification and firm performance. This suggests that there is a turning point after which increasing product diversification enhances firm performance. In addition, according to the analysis of more than 3,000 firm-year observations from more than 40 economies, this PhD thesis finds that foreign acquisition outperforms domestic acquisition in terms of improving target firm's performance.

Chapter 2 studied the relationship between multinationality and firm performance in the context of emerging economy multinationals. Based on the analysis of more than one thousand firms from 44 emerging economies during the period 2004-2013, we find that there is a curvilinear relationship between multinationality and performance. The performance positively correlates with the a low level of multinationality, while it negatively correlates with the a high level of multinationality. We also find that there is a significant positive linear correlation between multinationality and performance. This positive effect is greater when (1) investing in developed rather than developing countries, and (2) the firm is private-owned rather than state-owned.

Chapter 3 studied the relationship between product diversification and firm performance while considering product relatedness. Using the data of more than twelve

thousand firms from 63 economies between 2004-2013, we find that there is a turning point after which the negative effect of related diversification on firm performance switches to positive, while unrelated diversification only has a linear negative effect on firm performance. We also find that (1) the turning point of vertical diversification occurs at a lower level of diversification, while horizontal diversification has a weaker U-shaped relationship with performance; (2) the turning point of upstream diversification occurs at a lower level of diversification than downstream diversification.

Following the examination of the individual effects of international and product diversification on firm performance, in Chapter 4, we examined their joint effects. Based on the above same dataset, we find that there is a negative joint effect of the two diversification strategies. This negative joint effect is strengthened for firms in high-tech rather than low-tech sectors, and is weakened for firms from developed rather than developing countries.

Chapter 5 studied the relationship between acquisition type (foreign versus domestic) and target firm's performance with the consideration of acquirer's characteristics. Drawing on more than three thousand firm-year observations from 45 economies during the period 2004-2013, we find that, compared with domestic acquisitions, foreign acquisitions provide target firms with additional performance gains. We also find that this foreign acquisition premium is greater when (1) the acquirer originated from a developed economy, and (2) when the acquirer has high multinationality.

The extant knowledge on the multinationality-performance relationship has been limited to developed economy MNEs (mainly US firms) (Yang and Driffield, 2012; Nguyen, 2017). Also, the studies on the performance implications of ownership and location advantage are far from sufficient. This PhD thesis provides new empirical evidence for emerging economy firms, highlight the importance of ownership structure and FDI location choice. Based on the analysis of more than one thousand emerging economy MNEs, we find that there is an optimal level of multinationality

with respect to improving firm performance. We also find a significant positive linear relationship between multinationality and performance. Second, we find that this positive effect is stronger for FDI into developed markets relative to developing markets, while it is weakened for state-owned enterprise rather than private-owned enterprise. Our results emphasises that emerging economy MNEs use their own advantages, such as acquiring and learning from foreign strategic assets, business group affiliation, government support, relational assets and the implication of catch-up strategy (Khanna and Palepu, 1997; Cai, 1999; Dunning, 2003; Mathews, 2006), to quickly overcome the liability of foreignness and realise the multinational benefits. This is consistent with the findings of Gaur and Kumar (2009). We think our findings help to provide a better understanding of foreign direct investment. There has been a surge of FDI outflow from emerging economies in the past 16 years since 2000 (UNCTAD, 2017). We also believe it has some important managerial implications for managers of emerging economy MNEs. It helps explain, for instance, why emerging economy MNEs are actively investing in developed countries, as well as why private-owned enterprises are more successful in foreign investments than state-owned enterprises.

The existing literature on product diversification-performance link has been limited to single country studies (mainly US, UK or Japan). This PhD thesis provides new empirical evidence for MNEs from sixty-three economies. In addition, a recent survey paper (Dhir and Dhir, 2015) highlight that limited attention has been given to the finer classification of product diversification. Based on the analysis of more than twelve thousand MNEs from a very large country coverage of sixty-three economies, overall, our results indicate that diversifying after a turning point enhances firm performance, which is to some extent consistent with the findings of de Andrés et al. (2017). Diversification beyond the turning point allows the firm to enjoy synergy effects that outweigh the costs of diversification. In contrast, diversifying into unrelated products is detrimental to performance due to the lack of synergies between unrelated products.

Next, we find that, similar to related diversification, there is a turning point of vertical related diversification, after which increasing investment in vertical products leads to better performance, while horizontal diversification has a weaker U-shaped effect on firm performance. This is in line with Hendricks et al. (2009)'s findings that indicate a positive effect of vertical diversification on firm performance. However, our study differs from this paper by distinguishing between vertical and horizontal relatedness, which could be an important contribution to the literature. Further, we find that there is a turning point for upstream and downstream diversification. More specifically, the turning point occurs at the lower level of diversification for upstream than downstream products. This suggests that the turning point where the diversification benefits exceeds its costs occurs earlier when the firm diversifies into vertical related industries, particularly upstream vertical related industries. This might be because vertical related business and particularly upstream vertical related business, can utilise complementary resources with core products, leading to the greater synergies, due to the up-to-down knowledge flow, innovative capabilities, quality certainty, reduced input costs distortion and delay in supplies.

We think our results make it possible to provide a better understanding of diversified product investment. There is a current trend of vertical disintegration investment by emerging multi-product giants from developed and developing countries, investing in upstream and downstream products (Boehm et al., 2016; UNCTAD, 2017). We believe our findings have vital implications for decision-makers of the firms. For instance, it might help to explain why some firms are inclined to invest in vertical or upstream business so as to achieve synergy effects, instead of being conglomerates or horizontally disintegrated firms.

Following the examination of the individual effects of geographic and product diversification, we analysed their joint effects. A recent paper calls for more research on the interactive effect of the two diversification strategies (Bowen and Sleuwaegen, 2017), particularly considering the substitute or complement effects. Within a few attempts, they generally ignore the contextual factors that strengthen or weaken

the joint effects Hitt et al. (1997); Geringer et al. (2000); Kistruck et al. (2013). To address these limitations, analysing the data from the above same dataset, we find that there is a negative interactive effect of two diversification strategies. Product diversification tends to have a substitute relationship with geographic diversification. This result is, to some extent,f consistent with the findings of Kistruck et al. (2013). Due to the resource constraints in the short run and the growing bureaucratic costs of implementing both strategies simultaneously, the firm faces a trade-off between the two strategies. Further, we find that firms from high-tech sectors experience a stronger negative joint effect, relative to firms from low-tech sectors. We also find that firms from developed countries experience a weaker negative joint effect, compared to firms from developing countries. We believe that these findings could provide a better understanding of how to balance the growth of two diversification strategies. The world FDI flows have a strong recovery and reached the highest level since the global financial crisis. In 2016, however, there was a slight decrease to US$1.75 trillion (UNCTAD, 2017). We think our results have important implications for decision makers in the firms. It might help to explain, for instance, why some firms are inclined to increase their foreign presence with a narrow range of product; this is termed 'globalfocusing' by Meyer (2006).

Apart from the research of firm diversification in chapters 2, 3 and 4, which focus on the parent-level analysis, chapter 5 highlighted the subsidiary-level analysis. A recent survey paper (Nguyen, 2017) contends that current MP studies exclusively focus on the effect of multinationality on the parent's performance (i.e., the consolidated performance of the home operation and foreign subsidiaries), ignoring that the foreign subsidiary is the one that actually represents the foreign operation. Also, the current foreign acquisition premium literature pays little attention to acquirer's characteristics (Bertrand and Zitouna, 2008; Geluebcke, 2015).

Motivated by these two points, we believe the current foreign acquisition premium literature could be improved. Drawing on more than three thousand firm-year observations from forty-five economies, first, our results indicate that foreign

acquisition outperforms domestic acquisition in terms of improving the target firm's performance. The transfer of knowledge-based firm-specific advantage by MNEs to a foreign subsidiary through acquisition could enhance the subsidiary's performance, particularly productivity (Helpman et al., 2004; Douma et al., 2006; Bamiatzi et al., 2017). Further, we find that acquirer's developed economy location and multinationality strengthens the foreign acquisition's additional contribution to the target firm's performance, relative to domestic acquisition. These findings could be important contributions to the literature if we consider the emphasis on acquirer's characteristics of our analysis.

Cross-border M&As have been back on a growth track since 2014 and MNEs have more confidence in the M&A trail (UNCTAD, 2017). We believe our findings have important implications for policymakers and managers. For instance, it encourages governments to facilitate cross-border acquisitions and cast some doubt over the fears of foreign acquisitions for their impact on target firms' performance. It may help to explain why some target firms' performances benefit more from foreign acquisitions, where the acquirers with high multinationality are involved. The reason might be that acquirer's multinationality to some extent represents the international experience or capability of being a multinational. The higher the acquirer's multinationality, the greater the parent's capability to transfer the knowledge-based firm-specific advantage to a subsidiary in order to enhance the target's performance in the overseas market (Nguyen, 2017).

6.2 Limitations and Further Research

Although this thesis advances the research on firm diversification by unveiling its complex performance implications under important underlying factors, such as geographic location and product relatedness, this research is not free of certain limitations that might point to interesting further research directions.

First, our multinationality-performance study currently focuses on emerging economy multinational enterprises. It might prove interesting for further research to

estimate an MP model with data from both emerging economy multinational enterprises and developed economy multinational enterprises so as to test for differences between the two groups.

Moreover, due to the data restriction, we have cross-section instead of panel data with respect to product diversification. This prevents us from controlling for firm fixed effect. The Orbis database only has cross-sectional industry classification information such as NACE Rev.2 code. Thus, we could not trace the dynamic evolution of a firm's industry activities, we could only compare industry activities across the sections (firms). Further research is needed to further investigate the dynamic nature of the firm's diversified industry activities and its long-term performance effects by employing panel data.

Further, we do not rule out the endogeneity issue. Perhaps better performing firms are more confident and can afford to undertake foreign expansion and product diversified investment. Also, due to the data availability in Orbis, we do not know the diversification mode, including internal development and external development (e.g., greenfield investment vs. acquisition). The diversification mode tends to interact with the diversification level and type (related versus unrelated). Further research could seek to extend our study by repeating the same tests for more recent years, and investigate the causal relationship between product diversification and firm performance, particularly with the consideration of the diversification mode. Besides, there are likely to be large differences in performance, depending on whether a firm comes from a developed or developing economy and where its upstream or downstream affiliates are located. Also, further research may attempt to extend our understanding of how the product relatedness choices of firms across different geographic markets impacts firm performance.

In addition, the firm-level data of this PhD thesis mainly rely on Orbis and Zephyr, both of which belong to the European consultant company Bureau van Dijk (BvD). These two BvD datasets contains the financial and M&A information for both listed and unlisted firms across the globe. To avoid too much reliance on

one data source (BvD products), further research avenues are encouraged to validate our findings by combining different data sources, such as Compustat and Thomson Reuters SDC.

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